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MR. STANLEY.

MR. STANLEY'S achievements in Africa have been so great, his services to geographical science are of such extraordinary value, that the occurrence of anything which would appear to detract from his merits as an explorer is much to be regretted. Our readers have been able to follow Mr. Stanley in his wonderful journeys by means of our periodical notices. In our number for December 1875 (p. 369) we gave an account of his proceedings from Mpwapwa to the Victoria Nyanza, and of his circumnavigation of that great lake, the paper being illustrated by a map. In our number for September 1876 (p. 245) we gave some further details of Mr. Stanley's discoveries in the lake region, including the untoward event at Bambireh, and this article was also illustrated by a map of the two lakes Albert and Victoria Nyanza. Mr. Stanley's account of the Lukuga outlet of Lake Tanganyika will be found at p. 106 of our number for April 1877, and we reproduced Mr. Stanley's maps of the Lukuga, and of the Alexandra Nile in our number for May 1877. The first news of the discovery of the course of the Congo was reprinted in our number for October 1877 (p. 275), which was followed by a fuller account, with a map, at page 318 of our number for December 1877.

A strong feeling of disapproval of Mr. Stanley's proceedings at Bambireh was expressed on the publication of his letters in the *Daily Telegraph* in August 1876. We certainly shared in this unfavourable impression; and in our article of September 1876, we characterized the second attack at Bambireh, judging from the account given in the *Daily Telegraph*, as an "act of barbarity," and as a "piratical proceeding," which, "so far as appears from his letter, is without any justification."

The letter in question, which was written hastily and in the midst of toilsome and exciting work, does not describe all the circumstances which led to the attack, and judging from it alone, we did an injustice to Mr. Stanley which we hasten to acknowledge. At the same time the words of the letter certainly justified the unfavourable impression it conveyed to several unprejudiced minds. Colonel Yule has publicly expressed his opinion on this subject; and all who know that illustrious geographer know also that his bias would naturally be in favour of the absent, and that nothing but a strong sense of duty would have induced him to utter a disapproving word against any man. But the additional circumstances, which have become known since Mr. Stanley's return, place the incident at Bambireh in a different light.

Mr. Stanley was placed in command of an expedition, which was equipped with a view to the use of force in carrying out its objects, if force should become necessary. It may be a question whether private individuals have the right to despatch such expeditions, but this question concerns the employers, not the employed, and no enterprising young explorer would refuse such an appointment if it was offered to him. Mr. Stanley certainly cannot be blamed for undertaking what any other man who was worth anything would have jumped at, if he had had the good fortune to be offered a similar chance. Mr. Stanley, then, must not be blamed for using force. All that could be expected from him was that he should refrain from using force except under circumstances of absolute necessity, and of this he alone could be the judge. In his hastily-written letter, published in August, 1876, no such necessity appeared, and hence the disapproval we then felt and expressed. But we now find that Mr. Stanley considered that there was a real necessity for the second attack at Bambireh. The natives of that island had, after the first attack, massacred six of the Uganda men who had come as Stanley's allies, and according to his information they intended to attack his crowded and heavily-laden canoes on their voyage. These are reasons, of the strength of which the man on the spot, surrounded by perils on all sides, and responsible for the lives of many followers, must be acknowledged to be the sole competent judge. We gladly accept them as sufficient.

Mr. Stanley has not only established for himself a great and enduring name as a discoverer. He will also be remembered as one who conciliated the natives when he believed conciliation to be possible, and who stood by his own servants and followers like a true and faithful friend. The way in which he stuck to his Zanzibar men, and remained with them until they were safely landed in their own homes on the other side of Africa is a noble trait, and one which furnishes strong presumptive evidence that the force he used on occasions was an unavoidable necessity.

It must be a source of great pleasure to all lovers of noble deeds—and there are none nobler than those achieved by geographical explorers—to know that the discoverer of the course of the Congo forms no exception to the rule that brave and intrepid men are ever reluctant to substitute force for conciliation, and always prefer working rather by kindness and generosity than by a resort to their superior power.

THE CLIMATE AND SOIL OF SICILY.

NOT very long ago, it was a generally received opinion that the south of Europe consisted of old, worn-out, exhausted countries, unfit for civilisation, and where improvement was hopeless. All travellers from the north of Europe were unanimous in their accounts; for in the south they found no green fields, good roads, or hotels, but, in their stead, heat, dust, insects, beggars, and many other disagreeable drawbacks to the pleasures of travelling. In short, everything was different from what they had left at home, and of course worse. It was so pleasant, from the proud height of their civilisation, to look down on the decay of others. Soil and climate, and, above all, history, had created the state of things found in the countries in question; and, in truth, to one furnished with some slight historical knowledge, it was astonishing to find man and soil in such high culture. But few found the time for reflections of this kind, and allowed their judgment to be overruled by the first superficial impressions. I have met hundreds of travellers, during long travels in Southern Europe, and, with few exceptions, all were governed by prejudice in their opinion of these countries. It is only quite of late years that competent men have protested against these opinions. Above all should be mentioned the well-known naturalists, Franz Unger and Victor Hehn,* with whose opinions I agree in every respect; and I am only now completing their inquiries by my own observations and studies, made especially in Sicily.

We will commence by forming, as far as is possible, an idea of the culture of Sicily, founded on historical information. There is no doubt but that Sicily was once covered with forests, like the greater part of Southern Europe, although there are no original documents to prove this. Italy, as Hehn has proved, was in the Greek epoch a country which, compared with Greece, partook of the characteristics of the north, and exported only corn, timber, and cattle. In the time of the Peloponnesian war, and even in that of Theophrastus, it passed for a wooded country; and this will not astonish any one who knows the south of Italy well, for even at this day it may be called a wooded country. The ridge of the Apennines, from Naples to the Straits of Messina, is covered with forests, descending in some places to the sea-shore. The Sila, which supplied the gigantic mast of the famous galley of Hiero, are to this day, like Aspromonte, opposite Messina, covered with forests, bearing in many places the characteristics of virgin forests, in which are found gigantic specimens of the *Pinus laricio*. But they will not long survive, in spite of their best defenders—the want of high mountains and roads; for the Italian Parliament is about to take them under its protection, and doubtless before many years have passed, they will have disappeared. With the Greek colonies, and with the extension of the Roman Empire eastward, forests were replaced by fruit trees, though it is improbable that the plantations of fruit trees were more extended than they are at present. The borders of the sea, the plains, the valleys of the rivers, and the lower slope of the mountains were covered with them, in the same manner as to-day the plants peculiar to the Mediterranean vegetation spread themselves. This is, I think, the meaning of Varro (i., 2, 6), when he says—"*Non arboribus causita Italia est, ut tota pomarium videatur.*"

In many of Horace's occasional remarks about cultivation we recognise the Italy of to-day: he often mentions the oak woods, game and hunting, and the elm tree supporting the vine as it does at the present time. But we can find no such mention of Sicily in old days, for if one is allowed to go back as far as the Homeric songs it is spoken of as a land famous for breeding cattle; while in historical times it was noted for its agriculture. The Carthaginians doubtless introduced slave labour, and the same system prevailed among the Romans, and the Greeks, especially the Syracusans. Sicily was the granary of Rome, and is so called by the elder Cato (according to Cicero, in Verrem ii., 5). Nobody knew this country better than Cicero, who governed it as quæstor, and afterwards travelled through it, collecting evidence against Verres. From his orations against Verres we learn the importance of the Sicilian agriculture, and also which were the districts most under cultivation, viz., those west of Etna, along the northern shore, the plain of Catania (the so-called Leontinian fields), and generally speaking the whole island, if one is allowed to judge by the names of towns inhabited by agricultural populations. By the fact that nearly all the land belonged to the towns, the Roman Republic, or to a few rich Sicilians or Roman knights, it is probable the farming system at that time was fully developed. The proprietors lived far from their estates, which were cultivated by the so-called free population and numerous slaves. Though large tracts of country were given up to breeding cattle, Cicero repeatedly says that the prosperity of the island is due to agriculture. The revenue was most favourable, the Leontinian fields yielding tenfold; now they reckon the revenue at elevenfold, but the leases are so unfavourable, that to gain their living the tenants must make fifteenfold.* The Sicilian historian Palmieri† has calculated the produce of wheat in the time of Verres, at 2,753,659 hectoliters, two-thirds of that of to-day, and he thinks that at that time the whole island did not produce as much as the Syracusan territory in the days of Gelo. It is very rarely that any culture but that of cereals is mentioned in ancient days. We only know that Aragontines cultivated the olive largely, and that the vineyards of Messina, Taormina, and Morgantia were celebrated (Athenaeus xii., 159); that in the time of Agathokles, the country round Palermo was called a garden, being full of fruit trees. There were famous gardens near Syracuse in Hiero's days; but the cultivation of fruit trees had no economic importance, nor did it in any way affect the character of the landscape. In the Greek epoch, the only woods mentioned are those round Etna, where Hiero got the timber for his great ship (Athenaeus v., 206). Moreover Diodorus (iv., 84) gives a description of the Heræan Mountains (the Madonie): "In Sicily are

* F. Unger, *Wissenschaftliche Ergebnisse einer Reise in den Griechenland und in Ionischen Inseln.* Wien, 1862. V. Hehn, *Kultur-planzen und Hausthiere in ihrem Ulergange aus Asien nach Griechenland.* Berlin, 1877.

* *Caruso Studi sulla industria dei cereali in Sicilia e la popolazione che la esercitano.* Palermo, 1870.

† *Somma della Storia di Sicilia*, i., cp. 14.

the Heræan Mountains so called by amenity. There are other peculiarities, as if created for a summer residence." It is said that there are many springs of excellent water, mountains covered with various trees, oaks of great size, and fruits double the size of those growing in other places; and that a Carthaginian army starving with hunger, was sustained by the fruits found in these mountains, and this fruit could not have been chestnuts, for at that epoch these trees were not found in Sicily; but very probably it was the fruit of the oak, which in ancient times was much used as an article of food. To this day, the Madonie are very rich in oaks, wild apples, and pears.

We hear, too, of the blooming meadows near Enna from which Proserpine was carried off; and of the plains covered with palmitos, near Cape Passaro, and of the enormous flocks that the Roman nobles pastured in Sicily. Horace praises the Sicilian cows. Turning to Theocritus,* who wrote in Sicily, or at least treats of scenes in his native land, we learn that in his time the so-called Maquis existed, which is a form of vegetation peculiar to the shores of the Mediterranean. Thorny brooms and rhamnus grow on the mountains instead of trees, the wood-cutters cut heath (*Erica arborea*), rhus cotinus, hawthorn, juniper, scilla marittima, cytisus (which is eaten by goats), pistacia lentiscus, arbutus unedo, and wild roses. These are the shrubs that grow in the pasture grounds of the goats, and are comprised in the Maquis, and the picture we so form to ourselves of the past, is not very different from that of to-day. Though less favourable now, there are wheat fields, cattle, and fruit trees, cultivated on a small scale, instead of vast flocks of goats, the Maquis extending everywhere, while the mountains are, as then, covered with woods. The Punic wars caused great ravages and much diminished the population. The civil wars still further diminished it, and in the times of Diodorus a great part of the island was a desert. Strabo only enumerates sixteen towns, four of which were in the interior, and the others all in ruins; the country was a waste, and in the hands of herdsmen. In the beginning of the second century things improved a little, and Pliny mentions sixty-nine towns. The days of Christianity brought no change: great estates existed, but instead of belonging to Roman knights, were made the property of the church. Small tenants, who no doubt had always existed, took the place of the slaves in cultivating the land, wheat continued to be the only export, and breeding cattle caused great tracts of land to be left without culture. Under the rule of the Arabs better times dawned, and in spite of continued wars, Sicily enjoyed a flourishing time, reminding us of the Greek epoch.

The Arabic and Berberic colonists, who had immigrated in great numbers, and occupied the western coast of the island, divided the great estates into small ones, and gardens and the culture of fruit trees soon became very important. The Arabs introduced here, as everywhere, the plants of their country, and their mode of culture; and if we had no information on this point, we should learn it from the words and expressions made use of in the popular dialect in the cultivation of gardens, fields, and fruit trees,† in Western Sicily, being all of Arabic origin. Had not the island been divided into small estates, it could never have supported the large population of those days, which Amari believes was as great as at the present day, only differently distributed. According to documents and contemporary notes, there were 1000 inhabited places, amongst them 900 smaller ones, double the number of to-day, the average number of the inhabitants of Sicily being now nearly 5000. For instance, in Corleone, a province of Palermo, in 1182, one square kilometre contained fifty towns or villages, while at present there are but twelve; which shows that in those days cultivation was carried to a much higher pitch than now. The principal produce was always wheat, the rich crops of which nearly covered the island. The cultivation of vines and olives had quite fallen away, and oil was imported from Africa; but in their place were grown sugar canes, cotton, silk, agrumi (oranges and lemons) in great abundance. The old writers praise the charming gardens, in which, at all seasons, fruit is found. Edrisi, in his description of Sicily (in 1154), mentions gardens and abundance of fruit in connection with thirty towns. Hugo Fellando, half a century later, in talking of the country round Palermo, mentions pomegranates, figs, locusts, almonds, walnuts, and cucumbers. Chestnuts and walnuts were exported to Africa. Abu-Hali-Hasan, in the eleventh century, talks of the woods on Etna rich with chestnuts, pines, cedars, and hazel-nuts. Woods are also mentioned near Messina, near Prizzi and Bivona. On Monte Lauro there were forests of conifers, and Monte Pellegrino, near Palermo, was covered with trees as late as the fifteenth century. In the times of the Normans, excellent sport amongst the forests and mountains is spoken of. In general, the opinion formed of this island in those days was a favourable one.

But these happy days did not last, and the present unhappy social state of things found its origin in the feudal system introduced by the Normans; but a great change took place under the Aragonese and Spaniards, the feudal seed bore fruit, and brought about the dominion of the nobility and feudal anarchy. Nearly half the Sicilian towns were founded by nobles from the sixteenth to the eighteenth century, and they induced, by all possible means, people to settle in them. In this way they acquired small dominions, and new and higher titles to give fresh splendour to the already-decaying power of the Spaniards, In order to render them inoffensive, these nobles were tempted to the court of the viceroys by high titles and frivolous pleasures and festivals. And in those days was developed the present condition of agriculture, which is unavoidable. Men have to walk for three or four hours to reach the place of their labour, and in these conditions brigandage finds its explanation and existence.

And so things continued until about 100 years ago, when, for the first time, it became possible that a peasant should own land of his own. From that time there was improvement. The increasing facility of communication, the sale and division of the Church estates, have given rise to uninterrupted progress during the last years. We must understand that the greater or less prosperity of the island did not depend on its soil or climate, but on its inhabi-

* *Idyll*, iv., 56, 57.; v., 64, 104, 128, 131; vii., 133; ix., 9; xi., 45; xxvii., 45. *Epig.*, i., 6.

† *Rivista di Filologia e Istruzione classica*, ii., p. 575, 1874.

tants. If the population in the time of the Peloponnesian war was, according to Belach (Belah?), 3,600,000 (but according to an estimation of my own, not more than 3 millions); in the days of the Arabians, 2½ millions; and under the Aragonese, according to Vanneschi, only one million; under the Spaniards, in the middle of the sixteenth century, only 800,000; in the middle of the seventeenth century, again one million; in 1770, 1,294,215; in 1814, 1,800,000; in 1815, 1,648,955; in 1861, 2,392,414; and at present, 2,700,000 inhabitants. *Nature has undergone no change, but man has.* The causes of the fluctuation in the numbers of the population must be sought for in the history of the many wars that devastated the country and in the rule of the Spaniards, which was even worse than that of the Bourbons. The Spaniards nearly succeeded in laying tracts of the island desert, as in their own country (which they call *despoblados*). Where their foot trod and where their institutions took root, life, material and intellectual, began to dry up, and this with great rapidity in Sicily, where war was uninterrupted, while her coasts were ravaged by barbarians, even to the beginning of this century, burning, wasting, and destroying all traffic. Even the activity of Charles V., who at any rate defended the coast, could not check this decay. After his death the mischievous feudal system developed more and more. In the East, Turks and Mongols carried out the work of devastation so thoroughly that to this day the country resembles a dead body; and the same may be said of Sicily. The Turks and Mongols where replaced by barbarians, by Spanish despotism and Spanish religious fanaticism. The first act of the Spaniards was, as in Spain, the expulsion of the Jews, who formed a numerous and industrious portion of the population. As in Spain, the country was covered with the seats of noblemen and rich convents; and as in Spain, the numbers of monks and priests increased at an enormous rate, and the souls and bodies of their bondmen were given over to them. So, perhaps, after all, it is a cause of wonder and of credit to the Sicilians that they and their country are in the high state of cultivation they now are.

Thus, as we have seen, the population of Sicily at its most flourishing times was not higher, or very slightly so, than at present. The yield of wheat was probably never greater than now, in spite of the population being occasionally distributed more favourably. The same wheat-fields produce as much to-day as 2000 years ago; and, doubtless, with smaller estates and better cultivation the produce might be doubled or trebled. Fruit trees were never so extensively planted as now, when Sicily yearly exports fruits worth 125 millions of lire—never were plants so precious for commerce grown as at present. It is according to history and civilisation that population increases or diminishes.

The supposed exhaustion of the soil *(Marasmus senilis)* cannot be attributed to the conduct of men. It is possible that one day in the plains of Germany and America (United States), now famed for their fertility, it will be necessary to employ combinations of kali and natron, phosphor and silicans, so necessary to the growth of plants, because there there is no volcanic force to bring forth from the mountains their mineral treasures. It is quite possible that in these countries exhaustion will take place after a long series of years of agriculture, and the destruction of forests whose roots penetrate into the soil, bringing up their treasures and spreading them over the surface of the earth. But this is not the case in Southern Europe; there, plains are few and not extensive, and wherever they occur irrigation is possible; the soil is formed of limestone, and they are surrounded by mountains of limestone formation, that with their numerous fissures, form a kind of sponge, from the heart of which flow springs rich with mineral substances, which is a blessing that cannot be sufficiently prized in a country swept for four or five months every year by the trade winds. Sicily belongs to the secondary and tertiary formation, and is rich in organic remains. It has springs, and a sufficient rainfall equal, in the average to that of North Germany. Only one-third of the water yielded by springs is used in agriculture. The elder Saussure was right in refuting the supposed idea, that the plains of Northern Italy were decreasing in fertility, and this idea is equally untrue of Sicily. Nowhere in the Mediterranean are climate and soil more favourable, and there are no contrasts as in Spain, where one step from the watered and rich huerta of Valencia lands you in an arid desert. Cultivation in Sicily does not depend wholly on irrigation, there are gradual transitions; and it is only in the height of summer that some of the wheat-producing country of the interior presents a dried-up appearance.

The planting fruit trees on ground where for thousands of years nothing but wheat was grown, which must cause a greater fertility, trees not only needing other substance than cereals, but penetrating with their roots down into virginal soil. Even where crop after crop of wheat has been grown, the exhaustion of the soil is prevented by the violence of the winter rains, which from the hills wash down earth and rocks, and so supply mineral substance. The saying of Charles Fraas, "that advancing civilisation of nations leaves behind it a desert, and so digs its own grave," can be applied less to Sicily than to other countries.

We have already answered the question, "has vegetation changed during historical times?" that the vegetation of Sicily, like that of the Mediterranean countries generally, has been changed by the introduction of new plants—more especially in the evergreen zone—and though this is not the production of cultivation, nevertheless, has been caused by it. Can we imagine Palermo, the famous Conca d'oro, without forests of agrumi; without hedges and fields of opuntias and agaves; without locust trees clothing the rocky sides of mountains; without olive trees and vineyards; without plantations of sumach; without date palms, cypresses, and pines; without almond and plane trees, all of which have been introduced in historical, and some in quite recent times? It is hardly necessary to enumerate fully other and less conspicuous plants, some of which have been introduced accidently. I will only mention the oxalis cornua, so common in Sicily and Southern Spain, and mesembryanthemum acinacifolium, from the Cape of Good Hope, but there can be no doubt that many of the plants of Sicily have been introduced with the sugar cane of the Arabs, with the cotton, olive, sumach trees, &c.

Finally, has the climate of Sicily undergone changes; has its annual rainfall diminished; or is it hotter than

it once was? To these questions we must reply in the affirmative, but with great restrictions. No doubt that the climate of a country can be affected by cultivation, the destruction of forests, drying up of marshes, &c. It can become warmer, and the rainfall become more irregular, as has been proved in many instances. Clearing away forests in entire provinces must exert a mischievous influence. But instead of inquiring further into this vexed question, I will refer the reader to that well-known Scotch meteorologist, David Milne Home, who has devoted especial attention to it. He has collected many instances of springs drying up in consequence of the felling of forests, and of their reappearance where the forests have been allowed to grow up again. This has happened at St. Helena, where, at the present day, the rainfall is double what it was in the time of Napoleon's captivity, and this has also been observed in many parts of Germany.

In general the climate of Sicily has undergone no changes, for it has been under more powerful influences than that of men. Three thousand years ago, when, in all probability, the island was covered with dense forests, the same trade-wind blew in summer, and the same equatorial current in winter, and in consequence there was a dry and a rainy season; but they were not so distinct, and the dry season was shorter. The woods which covered the island necessarily preserved great humidity, and forced the damp equatorial current to give rain later in the spring and earlier in the autumn, and perhaps occasionally during the summer, as the improperly-called trade-wind of the Mediterranean does not prevail absolutely. Directly the forests were destroyed, the rays of the sun fell on the unsheltered earth; and this formed a warm current of air, which could not condense the clouds and form rain, unless under some very favourable circumstance, such as meeting with a cold current. In this way the climate has been changed by the progressive destruction of forests, and by the loosening of the soil by culture, which renders it more accessible to warmth. Even now, the wooded tracts of Sicily have more rain than those that are treeless.

Two writers tell us that, in days not so long past, more rain fell in Sicily, and her rivers were full of water. Edrisi says that the river of Lentini, the ancient Terias, now San Leonardo, was navigable for ships of burthen, as well as the river of Ragusa, the Erminio, and the river of Mazzara. Ibn-Haukal, who was born on the banks of the mighty Tigris, and who lived at Palermo from 972-973, A.D., speaks of the small Oreto, near Palermo, as a great river. One can easily believe that the Oreto was a great river down to the twelfth century, when the famous Admiral's Bridge was built, with its twelve beautiful arches; for no one in his senses would build such a bridge for the Oreto of to-day, which, even after the heaviest winter rains, does not fill one arch, and none of the rivers mentioned are now navigable. Castragiovanni, the ancient Enna, contained in the Arabian epoch, within her walls rich springs, arable lands and gardens. Now the springs are very poor and dried up in summer, and the gardens have nearly disappeared. Thus there can be no doubt, but that the country has become somewhat drier than it was in the times of the Arabs; but, in still more ancient days, that there was scarcity of water is found by the aqueducts and cisterns belonging to ruined Greek and Sicilian towns, such as Grammichele, Mineo, Scordia, Lentini, Syracuse. Other wells were also mentioned in ancient days, and some exist to this day, and the Conca d'oro of Palermo, is still one of the best-watered countries of Southern Europe. No doubt the climate of Sicily has modified, it has become less dry, but there is no real change in the climate. It is the same with Greece, which, however, has been less favoured by nature than Sicily. Franz Unger proves that it was far more arid in ancient days, and that the actual state of things is to be explained by its history, not by a change in climate.

All who have travelled in Greece, and who have been close observers of the state of this country and its inhabitants at the close of the War of Independence, will share my opinion that this country is not only capable of being reclaimed, but is actually reclaiming itself; certainly not to the same degree as Sicily, but she had never sunk so low, and always belonged to a civilised nation, and was nearer Europe. As in Sicily, since 1860, cultivation extended everywhere, so in Greece it is spreading over great tracts of country, which for thousands of years had been the pasture-ground for countless flocks. Morally, socially, and economically, great progress is visible throughout Greece. But that at the same time that there should be no political improvement shows how unmixed is the descent from the ancient Greeks; and certainly her bad condition in other respects is not so much the fault of her own people as of those who suddenly conferred freedom on a nation torn by wars and brigandage, and incapable of self-government. Sicily would have found a time of transition from Bourbon despotism to a free constitution of immense service.

Theobald Fischer.

MEMOIRS OF HANS HENDRIK

(The Arctic Traveller).

III.

My Third Journey to the North.

[*With the 'Polaris.'*]

While I was at Kangersuatsiak, a post arrived from Upernivik informing me that Americans had reached there, and bringing two letters for me—one from the merchant, the other from Kekertarsuatsiak [Fiskernæs]. I found the letter from Upernivik to contain in substance:—The American Arctic travellers wanted to have me in their service; a boat was coming to fetch us, my wife and children being invited to go with me. They had also taken on board with them a native from the Westland [coast opposite to Greenland], with his wife and foster-daughter, and the American, Mister Morta, a friend of mine, whom I knew from my first voyage, when he was steward, and I also had him for my companion on my sledge-run to the far north. When I opened the other letter, it was from Kekertarsuatsiak, written by my brother, and informed me:—Since Simeon had perished in kayak they were alone, and their condition very sad indeed, and last year another person had perished in kayak; but, thank God! all

of us have a future haven, howsoever we fare by land or by sea, and our days are numbered. When I opened the third letter, I noticed it was not written to me, it being written in Danish. I merely had a look at the writing, and directly folded the paper again.

While I was reading over my letters, I heard shouts of "A boat!" and that it was white, and of a foreign appearance. Already knowing the Americans were coming, I went up the hill, and on the way met with the Assistant Trader. When I had informed him that the Americans were at hand to fetch me, he said: "Thou wilt not be allowed to join them, as thou art in debt." I answered that I was ignorant of my debt, and added: "By mistake I have broken the sealing-wax of the third letter; I did not understand it, as it was in Danish; I will deliver it to thee." When I had gone to fetch it, and given it to him, he grew very angry, saying: "Why hast thou torn off the seal?" I answered: "In ignorance I did so;" whereupon he ordered the Guardian to be called. The Guardian asked: "What does he mean?" I answered: "As I did not know a letter addressed to him, I broke it open, believing it was intended for me." He communicated this to the Assistant, who then grew silent.

The boat having landed, the Assistant Trader said: "The merchant wants thee to join them." A little while after the ship's Mate, Mister Tarsta, said: "What pay dost thou want per month?" I answered: "Ten *dollars* [Danish?]. He: "It is too little, is it not?" I said: "Twenty-five." He again: "It is too little." At last, as I did not demand any more, he asked: "Will fifty be sufficient?" I replied: "Yes, that will do." He added: "Art thou willing to perform sailor's work on board or not?" I agreed so to do, with the exception of going aloft. When I had spoken thus, he was satisfied, and said that we were to start the next day.

In the evening, Mister Tarsta remarked: "I will sleep in your tent." When we lay down to sleep, Mister Tarsta did the same, and the next morning my wife, having boiled coffee and cooked meat, regaled him with a cup of coffee, but with no meat, thinking he did not like it, although this was quite a mistake [?]. In the morning we departed. It was very sad when our friends came down to the beach to bid us farewell, as some of them were as dear to me as kinsfolk. It was then beautiful weather, and we sailed briskly along, with a fresh easterly breeze, I taking care of the sheet.

When we approached Upernivik, and came aboard the ship, my late companion, Mister Morta, rejoiced at seeing me again. The Master of the ship, Ull [Hall], was very kind and friendly, as were the natives from the Westland, John and his wife. We stayed one day, and, proceeding northward, touched at Tasiusak, whence in three days we came to where lived the natives.

The next day, when we made for their northernmost settlement, Eta, but still pretty far from it, I said to my comrade, the Westlander: "Yonder I lost my companion." He answered me: "Don't say so;" whereupon I grew silent. When our Master had gone away, I asked him: "Why didst thou forbid my speaking?" He answered: "The officers do not like to hear it, as they believe thou caused his death." I replied: "That never struck me when I spoke to thee; is it possible that any baptised man should be able to think of such a thing?" My comrade did not utter a word more.

Proceeding, and passing the northernmost station, Anoritouk, we steered for the Westland. On the way my wife fell ill from stitch, and grew still worse. At last John's wife said: "I think she ought to be cupped [?]; I should like to try it. It is a very dangerous case; I have seen many such; some got worse, some improved." I agreed, and she went to fetch her blood-letting instrument, and put it on her back, saying: "Now she will grow very hot, and when she feels difficulty in breathing, use this fan;" whereupon she sat down at her side. As she had said, the heat came on, and she felt half-choked, but fanning brought her breathing all right again.

In this state my wife became delirious, and said: "Itakavsak will come over us" [?]. She now grew very talkative, and continued: "Now listen to something. I remember that last summer a *Kivigtok* came up to me, while thou [Hans] wast on the journey to Upernivik with blubber. In the evening I went to fetch water. When I came to the large stone, a man approached, he who had disappeared last year; ye remember, he went out shooting, and did not return. When he drew near he said: 'I come to thee as thou art a stranger [belonging to the far-off Northlanders?]. Last year I ran away because I was in love with Nepisak's daughter, but they [her relatives] would not have it, when I was joking with her. She also was rather fond of me, and as they forbade me marrying her, I went away. I was also tired of needlework, my sister and mother being unwilling to sew my clothes; for this reason I fled from men. Last spring I met with my father in Satut, and also his brother, and last autumn I came upon the dogs of the Assistant at Itivdlinguak. When I was going to slip off, I practised it thus: I drove to the coast opposite to us, and coming to a small opening, I deposited my gun and my mittens on the ice, and pushed my sledge, which was loaded with two seals, into the water. Then I went ashore, and observed my two younger brothers running up. As soon as they came to the sledge they began lamenting [believing I had perished], and turned back; but after a little while a swarm of people hastened up, and, having reached the sledge, began searching in the water, although I was standing upon the hill and looking down upon them. When they started to go home, and my brothers and relatives cried out for me, I joined in their wailing. At the same time I heard some of them say: "It sounds as if somebody was crying up yonder." When I perceived this I stopped my crying.' The Kivigtok, after having finished this, grew silent. I went off to make it known; but I don't know how it was, when I met another person who fetched water, I had forgotten what I had to say."

My wife continued her tale thus: "Also once afterwards, while Hans was gone to Upernivik, and I slept with my children in the tent, a heavy shower pouring down, I heard a voice outside of some one wanting to come in. But among our dogs sitting on their haunches in the entrance there was one of brownish colour [?], and this was the reason why he could not enter." [She added that] When she had

taken a book, and placed it in the inner part of the tent, he finally went away [?].

What here my wife related was certainly true. On the day when that man disappeared, in the evening there was made inquiry for him, and people said that he had not returned. His two younger brothers had found the sledge floating in the water, and his mittens and gun placed on the ice. But they searched in vain for the owner. I believe also I can remember that when we started to go home from that spot, we heard a wailing; and when we came home, it was mentioned also by others that they had heard a sound as if somebody was crying on the hills. This is the end of my report on my wife's vision.

While we went on far towards the north along the Westland, we also arrived off the furthest point reached by Mister Morta and me on our sledge-journey. When my comrade questioned me about it, I remarked: "There we got two bears." That country was named Kip An Tusen. The great Master of the ship, Ull, during that time was very praiseworthy; he scarcely allowed himself any sleep. We proceeded still farther towards the north, between our country and the Westland, meeting with pack ice of an amazing height. At length we were wholly stopped; the ice closed us up and drove us back, I don't know how many miles. At last we began discharging the cargo on the ice, fearing we should be wrecked. But the next day we took it in again, as the ice spread away. We made for our country [the Greenland coast], and when Captain Ull first went ashore in a boat, they shouted "*Hurra!*" at having reached our wintering harbour.

Here we saw many wild geese upon the land, and the next day I went ashore with one man more, each getting four of them. There were lots of them, but they were very shy. One day, when we took a walk over the hills, we discovered footprints of musk-oxen not quite recent. On coming on board we reported this to our commander, who grew very glad to hear there were oxen in this place.

On September the 8th four of us, namely, the Doctor, Mister Tarsta, John, and I, set off sledging in search of oxen. We travelled the whole day, and took a rest after a journey of 8 [English?] miles, without having seen any live thing. The next day, I, with Mister Tarsta and John, went out on foot, leaving the dogs; only the Doctor remained, to look for some fine stones. We searched the whole day, but only discovered footmarks of oxen, not quite fresh. On our return I said to the others: "I will go this way," and parted from them. When I came to the tent, the others had arrived, also without having found anything. The next day we went in another direction, walking across the eastern hills, behind which we found an inlet covered with ice for a long way, the road to it leading over an extensive plain. We returned to our tent in the evening. Again off in the morning in another direction. We soon returned. While, towards evening, we were busy collecting stones to secure the tent, my comrade came up, whispering: "Look there up the hill; may that be a fox?" I turned round to look, and saw a big beast, whose legs were hardly visible on account of its hairy coat. To people who have not seen such before, it looks rather terrible. When it had stared at us for a while, it drew nearer. The dogs began yelling, and tore asunder their harness, but on coming up it attacked them, raising a cloud of dust about itself. As we could not get quite near, I fired at a distance, as did my comrade, but still it continued to pursue the dogs. We discharged our pieces I dont't know how many times before it fell. We had it dragged to the tent by the dogs, cut it up, and set to cooking. The flesh was similar to that of reindeer; the nape of the neck was very big. Next day, back to the ship, and our arrival gave the Master much pleasure.

Afterwards we used to go shooting. My comrade, the Westlander, and I sometimes caught seals; in this way we roamed about together. In October our Captain made up his mind to sledge, and we set off in one overland. We found the snow very deep, and stopped after 4 miles, made a snow-hut, and lay down to sleep. When we awoke, the Master asked me to return to the ship, and fetch one sledge more. So I set off, and after having stayed a short while on board, as they invited me to eat, I returned with two sledges and more dogs. After our arrival we proceeded again, my comrade with the Commander, and I with Mister Tarsta. We halted, and made a snow-hut, continued two days more, came to the sea, and took rest on the shore ice. Here the Master said: "To-morrow ye may go shooting, while Mister Tarsta and I push on afoot."

We started for the open water. I shot a seal which emerged through the new ice, and towards evening my comrade fired after another in the same way, but missed. When it appeared again I hit it, but the current drifted it to sea. Towards evening we returned, and later on our officers joined us. They reported that they had found a large hole in the glacier [?] . . . . and made steps in the ice with a knife . . . . lest they should slip down [?] When they heard of the seals I had lost, they were vexed, as they had taken a great liking to seal-flesh while staying for several years in the Westland. The Captain said: "To-morrow we will return to the ship."

We went to sleep, but kept quiet next morning, on account of a gale from the south. The day after we set off, reached our snow-hut, and slept there. After having travelled one day more, we again reposed. When we started thence, we at length got sight of our craft. We stopped for a moment to take our meal, agreeably excited by this view, whereupon all of us, shouting, hastened on board.

After our arrival, in the beginning of the evening my comrade entered our room, saying: "Our Father is sick." I asked: "Is he very ill?" "Yes; he is very sick." I rejoined: "But to-day he did not appear ill." Next morning, on meeting my comrade, I asked: "How is our Commander?" He answered: "Just the same." We went out shooting; each of us killed a seal, but my comrade did not get hold of his. For some days we roamed over the hills, but without seeing anything, except at times some tracks of hares. We also tried shooting at the water's edge, and sometimes saw seals, but found them too wild. Several days later our Captain grew better. My wife and children stayed every day in their room, according to his wish; but on returning in the evening, I used to go visiting. The Master, who was now quickly recovering, once said, that as now he felt well he should like to go out the next day. But when we

had gone to sleep, we were wakened by my comrade, who entered, saying: "Our parent is very sick." I replied: "Why, he was lately quite well!" When, thereafter, I went to see him, he was weak, and kept feeling the left side of his chest. My comrade accosted him, but got no answer. On seeing that he could not live, we said to each other: "When he is no more, how shall we fare, for he is our only protector?" When again we had gone to sleep, after midnight, he who kept watch knocked at the door, opened it, and said: "The Master is dead." When he had spoken thus, I said to my wife: "He says our Commander is dead; how will it go with us hereafter, as he was the only one who took care of us? What mournful news, that he who loved us so kindly lives no longer!"

Later on, we put our Master into his grave. When the days shortened, the ice broke up, and drifted us with it, our ship dragging its anchor in a heavy gale. My comrade and I both advised the Master who now had the command to drop the second anchor. When he had ordered the sailors to drop it, the vessel stopped. But then again we drifted towards a large iceberg [?] He ordered the sailors to ascend the berg [?], and fasten a warp. As none of them was willing, my comrade and I mounted the berg. It blew dreadfully, and on stepping down we found our faces frostbitten. The vessel was now fastened to the berg.

This was the first danger we incurred after the death of the Captain, who was so watchful and careful of us. While he lived we caught seals, I don't know how many, and geese, and I got one Ugsuk [a very large seal] and one musk-ox. When we were frozen up close to the iceberg, he collected the crew, and exhorted them not to be anxious, as they had two native providers, if we should be wrecked there. When the ice had formed, but before it had any thickness, my comrade said to the Master [?] that the iceberg would capsize. He did not mind, saying there was no fear. But when the ice grew thicker, our craft began to incline at low water, and to right itself at high water. At length she began to draw water, and it looked as if the iceberg would break and swallow her.

At the end of the dark season, when daylight began, we went out shooting. We also saw some seals, but they were too shy. Although at neap tides thin ice was forming, we, nevertheless, had open water during the whole of the winter, sometimes distant 3 miles from us. When it became light, it was about as far off. During the darkness the open water was close to the ship; when daylight appeared it withdrew.

When we had got out of the dark season, we used to walk up the hills, but there was no trace of oxen. We only got some hares, I have forgotten how many.

Once, when the sun had re-appeared, I heard that I was to be punished in man-of-war fashion. The sailors informed me: "To-morrow, at nine, thou wilt be tied and brought down to the smithy. Mister Tarsta will come to fetch thee after nine o'clock. Take breakfast without fear; if thou art afraid, thou wilt be treated ill." When I heard this, I pitied my wife and my little children. The next morning, when we rose, towards breakfast time, my wife, our daughter, and I fell a-weeping. Our little son asked: "Why do ye cry?" From pity we were unable to give an answer. However, they brought us our breakfast, and, though without appetite, we had just begun eating, when we heard a-knocking at the door. It was opened, and Mister Tarsta, with a smiling look, made his appearance, and accosted us: "*Godmorgen*, are ye eating?"—whereupon, still smiling, he petted our children and left us, and a heavy stone was removed from my heart. I also thanked God, who had shown mercy to a poor little creature. However, since the Captain's death, Mister Morta, and Mister Tarsta, and Mister Blaine, and the Clergyman, and some of the sailors were pretty kind towards me.

When it was daylight, and my comrade and I went out shooting, I said to him: "Why have they this horrible custom?" [corporal punishment]. My comrade answered: "Thine and my custom is to be ashamed of [the white men despise us?]. I cannot speak about it." When he had said this, I was long silent; then I rejoined: "Although in some measure I have an idea of that custom, I am nevertheless unable to understand it quite [?] Twice [I have seen it?], first in *Tartikene* [with Doctor Kane?], the second time in *Tart Eise*" [with Doctor Hayes?]. Whereupon he put in: "Yes, on board the man-of-war ships they are unable to abandon that custom. I should like to revenge [?] a relative of mine, a Westlander, who was treated in the same way. And likewise I saw a Tuluk, a very handsome youth indeed [exposed to it?]. But we poor natives must be very careful with regard to ourselves." When he had ended, I added: "Now first I begin to understand that detestable custom. While I was young, I would not believe it; I did not think it was said in earnest, and, moreover, did not understand English sufficiently. When I return, I believe I will not go with the Americans more. But should the English want to engage me, I will go with them. People say they are better." In this way we gossiped on what we had observed during our journeys.

After the sun had returned, I got one seal by *Maupok*-catch [watching the breathing-holes]. My comrade got none. He and the Doctor and the Clergyman made an excursion by sledge; but three days after they came back without the Doctor, to repair the sledge, which had been damaged. They also wanted me to join them with one sledge more. The morning after their arrival we set off, my comrade intending to drive with the Doctor, whom we reached in the evening, lodged in his snow-hut. When we had slept, we started, advanced the whole day, and stopped in the evening facing an open water. In the morning my comrade and I went shooting from the edge of the ice. I killed two seals, but only got hold of one, the other being carried off by the current. My comrade shot one, but lost it in the same way. When we came back it became pretty hot in our snow-hut. We set to cooking meat, and furnished our camp amply with blubber; it was in the native fashion, with a long wick. Next day, walked to the south over the shore-ice [ice-foot]. The Doctor said they intended to go to the southern cape, and asked when I thought we could be back again. I said: "To-morrow;" but he objected: 'We want to be back to-night."

We started, and wandered the whole day, and not before midnight had we reached our goal. Here we rested for awhile, started again, and then came back quite exhausted. It was also a thirsty trip; not

before our return could we get anything to eat or drink, and we had to lie on the snow. The Doctor and the Clergyman began sleeping. I was nearly doing the same, but, fearing the cold might be dangerous, I wakened them after a short slumber. Oh, how cheerful it was when we gained our sledges, and could sit down upon them! We met with John, who had waited for us, and, when he had slept, had gone to look for us and bring us refreshments. He said: "I was very anxious about you; I thought a bear had devoured you, or ye had fallen into the sea; my fears were many. I think now ye are nearly starving; here I have brought bread and *Panike* [?], but no cooking-pot." When we had rested and eaten, we went on again; where there was no shore-ice we were obliged to carry the sledge. On the other side [?] we came to my comrade's dogs, and thence to our snow-hut.

When we had slept here, the Doctor and John set out in a sledge for the interior of the firth, while the Clergyman and I remained. For some hours I went shooting on the edge of the open water, but without success, as no seals were to be seen. When I came back, the Doctor and John were still missing. It grew evening, and not before late did they return, having killed a bear—a small female one. They brought it entire upon the sledge, and then first it was cut up.

The following day we remained to let our dogs rest. But then we started on our return. We travelled the whole day, and a part of the night too, and arrived on board the ship the next morning at eight o'clock.

While the sea in front of us was covered with ice, we used to walk over it, and watched two breathing holes, but could not get at the seals. At last we began talking about going to look for musk-oxen. In the beginning of May we set out by sledge, John and I alone. We travelled the whole day, following the valleys between the mountains, but without discovering a living creature; we only perceived some tracks of hares. In the evening we stopped, and made a snow-hut, and had a lamp after native fashion, with blubber and a cooking pot. We had a supply of dog's food and *Pamikes* [?], containing fruits and sugar. Our eight dogs, as well as ourselves, were well provided for.

Here we stayed two days. We roamed about and searched in vain for oxen. On the third day we descended from the hills, and removed to a firth called Ingeverman Bay, on the border of which we built our snow-hut on the shore-ice. Next day, off sledging into the firth. When we came to an iceberg we brought up; and while my comrade examined the land through a spyglass, I remained on the sledge. But when he exclaimed: "Ah! just look in the glass, I see a small musk-ox moving over the snow." I went to look, and observed something like a big stone moving. We searched for more, and discovered nine others, in the same direction. Hastened in pursuit; but they were very far off, on the top of the hills. Over the ice we drove pretty quickly, our hounds beginning to grow excited. When we reached the land, my comrade took the lead, to hinder the dogs from making any noise. It was a long time before we came up to them. Then we loosened our team. When the beasts observed them they collected in a circle, with their horns pointing outward. My comrade said to me: "Their way is, that when they show fight to the dogs they retire, but then suddenly advance, and then again go back, sharpening their horns by rubbing them against the ground." When he had spoken thus, we fired, and some of them fell. But, lo! a large bull drew back, and then suddenly rushed forward in pursuit of the hounds. It was awful to see the snow rising about him, like a cloud. Again he retired, facing the dogs.

We continued shooting until we had finished them all off, and had got nine oxen in one day. When we began skinning them, my comrade said: "When thou observest an oxen quite free from blood, fill it up with snow; we shall then get water for drinking, we are much in need of water." As soon as I saw one of them with no blood inside, I filled it with snow, and after a little it had thawed, and we were provided with drinking water. When we had carried all our game down the hills, we went to our snow-hut, and had a good meal of beef. The following morning we fetched more of the flesh, but leaving a part of it. Again we went for more, until we had collected the whole in our snow-hut. Thereupon we took one day's rest, and then we repaired to the ship. We travelled the whole day, and arrived the next morning.

On board they had been very anxious, and thought we were lost. Consequently, when, on approaching, we shouted that we had got nine musk-oxen, they were delighted. After three days' stay we went off in two sledges, I with Mister Tarsta, and my comrade with Mister Maje. In one day we reached the snow-hut, and discovered on our arrival one musk-ox more. We went to sleep, and next morning walked up the hills, I with Mister Tarsta and John with Mister Maje. We proceeded towards the spot where the day before we had observed the beast. On approaching and spying after it, we got sight of one ox, and, looking farther, I discovered eight more of the same kind. I proceeded on foot towards the first, telling my companion, whom I left behind, that when I made a sign with my hand he might approach. When I came close to the beast I waved my hand, whereupon he drove towards me in the sledge. As he disappeared behind a hill, I grew impatient, and went to look after him. I had left my gun upon the sledge. When he came up I said: "I will fetch my gun." When I had brought it and came to him, he had already hit the game several times, but not before I joined him did we succeed in killing it. After having taken out its entrails, we went in pursuit of the other eight.

We found them browsing separately, but on seeing the dogs they crowded together, forming a ring. We began firing at them, and succeeded in killing them all. While we skinned them my companion broke silence: "Now I will go cook beef and boil coffee, while thou continuest skinning. When I have finished I will assist thee." When the meal was prepared, and we had eaten our meat, we finished skinning and cutting up, loaded our sledge, and returned before our companions had arrived. After awhile they appeared. When we had slept, we set off in both sledges to fetch our store of flesh. We ended our job, bringing it down altogether. Next morning we returned to the ship.

Although we had our large supply of flesh to bring home, my comrade and I remained on board for

several days to rest. Then we went off again, I, as usual, with Mister Tarsta, and my comrade with Mister Maje. When we had gone half-way we stopped and put up our tent, and thence reached our late encampment, with the stores, by the following day. After a day's rest we started on a trip to the end of this firth, to explore its interior. We found the firth headed by a glacier, and its interior also covered with perpetual ice, on which rested an immense number of stones. We made a sketch of the interior, and turned seawards again. On the road we raised our tent on the ice, and at last reached our late encampment. Next morning we crossed to the opposite shore of the firth, and ascended a hill, where Mister Maje at noon observed the sun, and reported that we were . . . . higher [latitude?] than the ship. When we started from this spot we travelled a long way, turned back in the afternoon, and built a snow-hut in the evening. Again advancing, we descended to the ice, and fell in with the traces of two oxen. Following these, we found a cow with her calf, and killed both. At length we came back to our camping-place, and thence to the ship.

After a stay of two days we went off again, I as before with Mister Tarsta and my comrade with one of the sailors. When we had stopped in the evening and began cooking, my comrade went up the hills and discovered two oxen. We hunted them on our sledges and killed them. After one day's stay we returned to the vessel.

Again, after several days, we got help to bring home the flesh. On reaching our encampment we obtained two oxen more. We returned on board, and, later, we two alone went out in one sledge, but got no more venison. Coming back we learned the sailors had been more fortunate, they had carried a tent with them, and brought in two oxen. After this our excursions ceased as the land grew too moist. In June, however, my comrade and I got some Utoks [seals upon the ice].

About this time there began to be a chance of boats passing northwards, although the heavy pack which incessantly came drifting from that quarter rendered it very difficult. However, two boats and provisions were transported over the ice a distance of 3 miles. My comrade asked whether we were to join the party, but the Master replied: "No, better be near the vessel; we must keep you as our purveyors." The skiffs then started, but during the following night one of them returned. The officer in charge, Mister Tarsta, reported that they were wrecked. The ice had crushed the other boat, he said. Some of the luggage was lost, but the crew were all saved. Now they had come to get a skinboat and provisions. When the ice opened they departed, but in the beginning of July one of the men arrived with the message that 25 miles off they had been unable to proceed any farther. They were closed up and cut off from the vessel.

Early in August we left the harbour with our ship, and tried to reach them, but were stopped by ice. We fired the ship's gun to warn them, but they could not hear it, whereupon we turned back. In the evening a heavy gale sprang up from the north. I went to sleep early in the morning, but was wakened at eight o'clock, and ordered to bring a letter to them and recall them. First they pulled me ashore in a place where I could not land, on account of the shore-ice offering no footing. Then they brought me to an ice-bare beach, but here I had to ascend a high rock; I was obliged to climb a precipice, which appeared quite inaccessible. Imagine my joy when I had reached the top! I set forward, travelling the whole day, and when at length I sighted the ice, and discovered two men at the edge of the water, to be sure I felt easy. I proceeded towards them, although with difficulty, from the ice being inundated. When I came to them, and inquired about the others, I was informed they were half-a-mile off. There were Mister Tarsta and the Doctor, and, as I had letters to the Doctor, I repaired thither. When I had found them, I said that the other day we had started in the ship, but had been obliged to turn back, and then had tried to warn them by firing a gun, and that now we were waiting for them to set out on our home voyage. Mister Tarsta rejoined: "The ice has been quite impassable." When I had slept there, I started in the evening with the Doctor; we went the whole night, and reached the vessel the following day at noon.

In August all the others likewise returned, while the ship was still retarded by the ice. Every day I went up the hills to watch the state of the ice, as the Master had ordered me to give warning when it was going to spread. On the 11th of August, in the night, my dear wife was delivered. What a happy result! After a little while she was restored, and, both being well, I went up the hill to watch the ice.

I found it had began to clear off. Speedily went down and reported to the Master: "The ice has spread; we ought to be off to-day." On hearing this he directly went ashore, and after a little while returned, whereupon he made ready to start. It was afternoon on the 12th of August when we set out. But after two days we stuck in the pack, and were brought down with it towards the south. While thus we were blocked, my comrade and I caught seals every day, and then began collecting a store of unskinned seals. At the same time while the ship rested immovable, they put up a tent on the ice, and filled it with bread. When we were off Kap Allikisat, a gale sprang up from the south. It was a pitch dark night, when the ice began moving northward, and the floes were jammed and pushed over each other. At last our ship began to crack terribly from their pressure. I thought she would be crushed.

On perceiving this we brought our wives and children down upon the ice, and hurried to fetch all our little luggage, and remove the whole to a short distance from the ship. Then the ice broke up close to the vessel, and her cables broke; but in the awful darkness we could only just hear the voices on board, and when the craft was going adrift we believed she was on the point of sinking. Here we were left, ten men, our wives and children, and the Tuluks, making nineteen in all, and having two boats, no boat remaining with the ship. When the others drifted from us we thought they had gone to the bottom, while we ourselves were in the most miserable state of sadness and tears.

But especially I pitied my poor little wife and her children in the terrible snow-storm. I began thinking: "Have I searched for [?] this myself, by travelling to the north? But no! we have a merciful

Providence to watch over us." At length our children fell asleep, while we covered them with ox-hides in the frightful snow-drift. At dawn our Commander Tarsta said he would make for the land with the men, as soon as their meal was done. When they had cooked and got their breakfasts they set off towards an island called Pikiulek, but before they could reach the shore they were stopped by new ice.

About this time we sighted the ship, which was approaching us, to our great joy. They steamed on, and I believed they would have observed us, but suddenly they turned, a heavy squall from the north coming on at the same time.

When our Tuluk companions were going to make for the land, they asked us to follow them, but my comrade and I preferred to stay behind, knowing that they could not get to shore. The cook also kept us company, saying that he found it pitiful to abandon us. Those who had tried to land returned after a while, not having succeeded. The north wind blew furiously, and the heavy seas threw us towards the Westland. Suddenly the ice on which we dwelled parted, and we were separated from the tent which contained our store of bread. When the ice touched the Westland it stopped, and packed together all around us. Here we made a snow hut. My comrade went out sledging, and how lucky!—he caught sight of the tent. Directly we started, dragging a boat to fetch some bread. At the tent we filled the boat with bread, and drew it over the ice to our camping place. When we left our wives and children I was afraid a bear would devour them, now I was consoled to see them unhurt, and after our arrival we had a good meal. Since we left the ship this was the first time we ate sufficiently.

The following day we deliberated whether we should remove to the floe where stood the tent, as it was very large and might serve us for an island during the winter. We resolved to proceed and first brought thither one of the boats, loaded with bread and luggage, whereupon we filled the other in the same way. My wife and daughter loaded the sledge with our little properties and pulled it, my wife carrying the baby in her hood. Our son was seven years of age, our youngest daughter four, and these poor things walked over the rough ice, my wife and daughter pulling the sledge, and I assisting those who dragged the boat—a sad sight. When they were going to be left behind, I told my wife I should return to her. When we had brought the boat to our new camping-place, I went back, followed by one of the sailors, and, finding my little daughter Sophie Elisabeth very tired, we placed her on the sledge, and more men came to help us. When we had finished our removal, we turned the boat over, I and my family going to sleep under it, while the Tuluks were lodged in the tent, and the Westlanders made a snow-hut for themselves.

The next day we built a snow-hut in the middle of the ice-floe. Fancy! this was to be our settlement for the whole winter. One day we rested; then my comrade and I went out sledging towards the land. On approaching it we fell in with new ice; I remained to look for breathing-holes, while my comrade proceeded towards the shore. I found some holes, and heard the sound of breathing; but as the ice was covered with snow, I could not get at the seals [which were scared by the noise]. My comrade had been on shore, and told me he had seen footprints of hares and foxes.

When we returned, we made up our minds to remove to the land the following day. We also drove in another direction, but without discovering anything. Next morning we tried to go shorewards, but our island, the ice-floe, began moving. It drifted seawards, consequently we turned back, and now we continued to be carried off incessantly in a southern direction throughout the winter. After some time we caught sight of land, but by-and-by lost it again. Every day my dear comrade, the Westlander John, and I went out hunting. In this way once he succeeded in getting a seal. What a joy, when we had a meal of flesh, and our lamps became supplied with blubber! Afterwards I again got a seal, a small one; I killed it at one shot. Wonderful indeed, we were so blessed with seals for our support, and that we so continued the whole winter.

Once, when we were out shooting, I fell through, having both legs under water. My comrade asked: "Art thou wet?" I answered: "No, I did not get wet." When we had tried shooting we returned, but quite near to our encampment a strong northern gale suddenly overtook us, and made both of us lose our way. The snow drifted terribly. As I was tired with walking, I stopped. Looking up towards the sky, I perceived many stars. Thereupon I proceeded, but came to a broad crack, and on going back, I fell in with the open sea. Now I thought my last day was come. I considered the miserable position of my dear wife and children, on a piece of ice in mid-ocean. Then I pronounced my prayer:—

> "Jesu, lead me by the hand,
> While I am here below;
> Forsake me not.
> If Thou dost not abide with me, I shall fall;
> But near to Thee I am safe."

When I had finished these words I ascended a heap of ice-blocks, and discovered a star rising a little above the surface of the ice. But it was my comrade, who had lighted a torch, and pointed it all round from the highest part of the uneven ice. I went down in the direction of what I saw; but on my road I again fell in with a fissure, turned, and went on, but again discovered something like a light. I moved forward, examining it, but was again stopped by the break. While here, some people were heard approaching, and when they came close they shouted: "Art thou Hans?" I answered: "Yes." Whereupon they said: "We had nearly fired at thee, believing it was a bear." I answered: "Never more I had reason to be thankful to anybody than to you, as I was quite unable to make out whither I had to go." When we came home I found my wife and children had been most sorrowful, but I thanked the merciful Providence on high.

While we drifted in this way throughout the winter, my comrade and I frequently got a seal. Our lamps were never out for want of oil. When sometimes our supply was almost consumed, one of us used to catch. Just before Christmas, each of us took a seal. How delightful, that our lamps were well supplied for Christmas! During Yule we finished all the provisions we had, except the bread; but we were consoled by knowing that daylight was near.

When the sun reappeared, we fell in with a great many black guillemots. Of course we also availed ourselves of them, as we were well off for guns—I had four myself, namely, three rifles and one double-barrelled fowling-piece. And we had plenty of shot. These articles I and my comrade John had taken care to provide ourselves with when we left the ship. At first we only threw them down upon ice, then we brought them some distance from the ship. We could, therefore, afford to shoot guillemots.

Although the sun again shone, no land could be seen, and it was truly appalling to think that our Tuluk companions and our wives and children would probably starve. However, we were taken care of by Providence, and the whole winter were supplied with seals. While still we lived on our island of ice, we fell in with bladder-nose and saddle-back seals, and they gave us a good supply of food.

As we advanced far south, we had a heavy swell, and, in a pitch dark night, the floe, our refuge, split in two. At length the whole of it was broken up all around our snow-huts. When we rose in the morning, and I went outside, the sea had gone down, and the ice upon which stood our house had dwindled down to a little round piece. Wonderful! There must be an All-merciful Father.

Some days after, when we had gone to sleep, we heard a gun fired. I went out and saw that a bear had been hit and had fallen. My comrade exclaimed: "We have got a big bear; how cheerful, we shall now have bear's-flesh!"

When we came still farther south the ice appeared more dispersed, and at last we made up our minds to go in search of land, although none at all was in sight. At the same time, we again met the heavy swell. We started in the boat, which was heavily laden. For some days we pushed on pretty well. When the seas came rolling they looked as if they were going to swallow us up, for which reason, at intervals, we landed on ice-floes. At length we made out land.

Again we rested upon a piece of ice. During the night a heavy sea came on; we slept with our children in the boat, while the others used the tent. As the sea still rose higher, it began washing over our place of sojourn. They were obliged to remove the tent, placing it upon the top of an ice-hillock, whereupon all of us had to keep hold of the boat. The children were placed in it, the women assisted us. When the sea began to move the boat, we all kept hold of the gunwales; the breakers looked as if they would engulph us. We exerted ourselves to the utmost each time when the sea began lifting us, whereas when it retired we pushed the boat to remove it to windward, because there was a danger of our being washed down into the sea to leeward. We did not stop until we had brought the skiff close to the edge of the ice. But now the sea reached the tent which was placed on the hillock. To be sure it was awful! whenever the waves washed over us we were in water up to the waist, while at the same time we clung to the gunwale, and all the while one heard nothing but exclamations: "Now use all your strength."

Towards morning the sea had abated, and when it grew light we discovered that some smaller floes were less exposed to the swell. I spoke with my comrade about removing to one of these, and our Commander Tarsta agreed. We put the boat into the water, loaded it, and went to a smaller ice-floe, which we found much better as it was not washed over.

As the sea grew calmer we pushed on. Seals were plentiful; we had no want of meat; and we used to take our rest on the floes. One night it happened that the ice which served us for our camping place parted between the boat on which I slept and the tent. I jumped out to the other side, while that piece on which the boat was placed moved off quickly with Mister Maje who was seated in the boat, and we were separated from it by the water. Our Master asked the sailors to make a boat [raft] out of a piece of ice, and try to reach it, but they refused. We never had felt so distressed as at this moment, when we had lost our boat. At last I said to my comrade: "However, we must try to get at it." Each of us then formed an *Umiardluk* [literally, a bad boat] out of a piece of ice, and in this way we passed to the other fragment. As now we were three men, we could manage to put the boat into the water. But when on doing so, it sank forward, Mister Maje fell into the sea. My comrade jumped into the boat at the same moment, and pulled him up; I, being unable to follow, remained standing on the ice. When they had taken me along with them, we proceeded towards the others; but meanwhile the ice had screwed together, and we stood still. We three men alone then hauled up the boat [?]. At this time night fell, and our companion who had been in the sea, and now was lying in the boat, was like to freeze to death. I said to my comrade that if he remained so he would really die; if he could walk about, it would be better. I had witnessed such a case before. When I had spoken thus, we asked him to rise, saying, that if he remained, he would perish. The first time he rose, he tumbled down; but, after having walked for a long time, he recovered. At day-break we discovered our friends close by, and the ice joined together. When first they had examined the road, they came to us and assisted us to drag the boat over to them.

When we had started from this place, we were soon stopped by the pack, and no live thing was to be seen. We began to be in need of provisions. We had no seal-flesh left, and the next day our small stock of bread was to be shared out. In the night I had just fallen asleep, as I was to have my turn of the watch, when I was wakened by hearing people speaking about a bear. Rising up, I saw a bear walking towards us. I said to the others that they must lie down near the boat, imitating seals [?], while my comrade and I went towards the bear, who alternately sank and reappeared behind the ice hillocks. We waited until he came close up to us, whereupon my comrade gave him a shot, and I finished him off. Thereupon the others joined us to drag him to the boat. How wonderfully did Providence bring us through the winter, and give us supplies! At length we were off the remotest part of the Westland, whither the ice had brought us since last year: we left the ship in the far north. We were now near the country of the Tuluks without having suffered any real misfortune. Before we had finished the last of our bear's-flesh the field opened, and we began catching seals, and sighted land, and when we proceeded towards it we fell in with a ship.

Once in the afternoon, while still making for the

land, we discovered a vessel steaming northwards. We tried to follow it; but night fell, and we stopped at the ice. At the same time there rose a dense mist. During the night we showed two lights near the boat, making them pretty large, that people on board might observe us. After midnight I went to sleep, when the others had risen. Towards morning I was awakened by hearing them talking about "ship;" and when I got up I saw it emerging from the fog. I directly set off in my kayak, and when I came to them they questioned me: "Who are ye?" I answered: "*Nord Polen mut Polaris Bebeles*" [peoples?]. Then furthermore they asked: "How do ye do?" I answered: "*Captain Ull Diet;*" whereupon they said: "Where's the ship?" I answered: "Last year we left it." On hearing this they said to me: "Just follow a little alongside the ship, we will soon stop her."

When we had come up to my companions, they lay to, to take them on board. I was the first who set foot on deck, then followed the others; and when all had come on board it was as if we were ashore. The Master of the ship and the crew altogether were exceedingly kind to us, and pitied us who had spent the whole winter, with our little children, on a piece of ice. They gave us tobacco and pipes, and, before all, a good meal. Their Master, from mere kindness, was like a kinsman to us.

When the mist cleared we discovered another vessel close by, steering towards flocks of seals which lay upon the ice. Then the sailors in a body went seal hunting. We were informed that the other ship now had a full cargo of seals, and intended to start on their return voyage. We delivered letters to them concerning our rescue, but our ship had first to complete its catch before returning.

(To be continued.)

THE BEGINNING.

GRUITHUISEN.

THE British scientific world has no problem before it at the present moment of more importance than the beginning of this earth. How did it begin to be? Our natural sciences and their present controversies hang on this peg. We have been told by the President of the British Association, Professor Allan Thomson, "*that we are just as ignorant of the mode of first origin of all the compounds of the inorganic elements, as we are of that of living matter.*

This was one of the most obvious truths in the learned and deeply-studied address to the scientific meeting at Plymouth. It has been often repeated since the time of Solomon; but in the face of this certain and acknowledged ignorance of primary details, men have invented—and men have accepted—certain theories of the beginning, not only of this earth, but of our solar system. On these ideals man is constantly engaged in explaining certain terrestrial phenomena, which cannot be explained truly without a knowledge of first principles. False interpretation must follow ideal data; and so we have around us volumes of unfounded structures and theories, crumbling to their ruin in vast confusion. Powerful associations and liquid pens prop up these world-theories with buttress and with brass, but these are equally without foundation, and must share in the ruin of the principle they confide in. Something springs on the site of all ruins, it may be a thistle, a nettle, or a bramble; we only hope to plant one germ of truth.

Natural history, physical science, mathematics, astronomy, and geology have lately differed as to the age of this earth by hundreds of millions of years. They take their data from the nebular hypothesis of Laplace. If the data were true, precise science could not differ in results. The uncertainty of this theory may be found elsewhere, but we take some of its main points for the sake of their contrast with the theory of the beginning by the German astronomer Gruithuisen. This theory was published at Munich, between 1832 and 1842, in *Neue Analecter* and *Astronomisches Jahrbüch*. The author must have had a full knowledge of the nebular theory, as it was published in 1796, and his ideal is exactly the reverse of that by the French astronomer.

During the last century Sir John Herschel discovered, and reported on, numbers of luminous nebulæ floating in space. Laplace adopted the novelties as worlds in making. He imagined that a similar nebula once occupied the whole area now embraced by our solar system; he brought this mass under the laws of attraction and gravitation, extending over a diameter of some 5,500,000,000 miles, forming the whole into one compact mass of rotating matter, which threw off by its centrifugal force, at varied distances, certain rings of matter, which formed our planets, till at last the planet Mercury was formed at a distance of 35,000,000 miles from the nucleus, which then "gathered with immense energy round its own centre, and formed the sun."* The ring which formed this earth having once belonged to "the fiery mass of the sun,"* retained its heat, and this is supposed to be still within the nucleus of this earth, providing the surface with its igneous phenomena.

Laplace made his solar system with so much mathematical precision, that astronomers, naturalists, physicists, and geologists embraced the uncertain hypothesis as a sure solution of many puzzles, saving geologists much trouble in arranging causes and effects. Improvements in telescopes showed that some of the nebulæ of Laplace were distant systems of worlds, and it is known that other nebulæ, now floating in space, are luminous vapours, having in them certain gases inadequate to world making. British science, however, still adheres to the nebular hypothesis of Laplace, in its tottering condition. But before it became so ruinous as it now is, the German astronomer, Gruithuisen, suggested a slow, gradual manner of making this earth. In comparing the two theories, we come upon the national characteristics of the theorists. Laplace began with an impulse without a cause, forming a molten earth without any known fuel. Gruithuisen brought his unknown dust together without a cause for their collection. Neither give the origin of matter; but both seem to have been guided by their own surroundings more than by any certain knowledge of the subject. Each has many believers, but they cannot both be right. A follower of Gruithuisen has kindly given us abstracts of the theory according to which he built up this earth,

* *Quarterly Review*, July, 1875.

with a mean circumference of nearly 25,000 miles, and a mean diameter of nearly 8000. The quotations which follow are from the MS. of Dr. E. Gryzanovski :—

I. "The earth, like all celestial bodies, is the result of a gradual agglomeration of cosmical dust. Ever since the primordial disturbance of equilibrium in the universe, matter has and must have continued to condense into particles. The bigger masses must have attracted the smaller ones."

We do not know of any primordial disturbance of equilibrium in the universe, and we do not know of the origin of dust. The fact, however, remains that the nucleus of this earth is composed of what we call dust. We are consequently forced to confess that dust existed, in some shape or another, before the nucleus was made. Certain atoms attract others now, and as the whole earth, where known, has in it more or less magnetic power, we may allow that attraction must have existed in the beginning, and must have aided in the condensation of matter.

II. "The first consequence of mutual attraction is contact and adhesion, more or less superficial, according to the violence of the shock."

The ideal shock militates against the gradual agglomeration principle. This supplied the necessary contact and adhesion. Dust falling gently adheres to over-polished surfaces, and becomes cohesive in accumulation and pressure. As the nucleus earth is composed of cohesive dust, we may allow that it acquired its condition without any violent shock. The only violent shocks that we know of as occurring on the surface earth, are produced by falling meteors; but none that are known of were violent enough to produce—

III. "The next consequence—rotation. The position of the axis of rotation and the centre of gravity depends on the shapes, masses, and position of the two coalescing bodies. If these shapes are irregular, the rotation will tend to restore regularity. The ideal being the spheroid shape. This tendency, though partly checked by the hardness, or inner cohesion of the two bodies, must induce a gradual disgregation in both bodies, apart from the sudden disgregation produced by the shock of the first contact. This gradual molecular displacement, which affects first the interior, and through it the surface of the new body, constitutes its history."

If rotation was a consequence of impact, there was no rotation previous to this action, and the agglomerated mass of dust must have been chaotic. But there had been a disturbance of equlibrium. Rotation and revolution cause our present equilibrium, so that it remains to be explained how it was maintained before the impact took place. If this explanation cannot be given, Gruithuisen's cosmical dust requires a new idea, and his cause of rotation is inadmissible. If the irregularities of the sphere while forming on the principles laid down were to be smoothed away by the action of rotation, how is it that our artificial and natural irregularities are not influenced by it? We have mountain peaks 5 miles high on dry land; we have many elevated peaks in the sea, notably the Island of Bermuda, the base of which is given with a diameter about 120 miles, with a mean depth below the sea-level on that line of nearly 3 miles. This pinnacle has been exposed for an unknown period, not only to the ideal force of rotation, but to the certain forces of water; yet the 'Challenger' found it still as an unsmoothed irregularity in 1873. As we have no knowledge of disgregation, internal or external, caused by the rotation of the earth, we cannot accept the third section as in any way connected with the history of the Beginning. Gruithuisen wanted these actions for his theory, consequently—

IV. "Molecular displacement producing friction must also produce heat. Thus every cosmic body becomes a reservoir of heat, unevenly distributed through its interior, but ever increasing—by no means greatest at its geometrical centre, or even at its centre of gravity. For even if the two coalescing bodies succeed in rounding off into a perfect spheroid, so that the centre of gravity would coincide with the geometrical centre, that centre is not the point of maximum pressure or of maximum heat. Pressure and density reach their maximum at a depth of two-thirds of its radius; therefore, if the centre of the earth were chemically homogeneous, its zone of maximum heat would form a spheroidal surface surrounding its centre at a distance of one-third of its radius. But the earth cannot be homogeneous, because the northern, with its vast continents and high mountains, having a larger volume than the southern hemisphere, must be specifically lighter, and chemical differences involve differences in the generation and condition of heat. This shows that the points of maximum heat in the interior of the earth, far from forming a continuous zone, must be very irregularly scattered and grouped along each radius."

This method of obtaining cosmical heat and igneous action was, we believe, adopted by Mr. Robert Mallet a few years ago. The great misfortune of the theory is that we do not know if the molecular action takes place. We have just assigned reasons why it should not take place under the arrangements suggested by Gruithuisen. We know that displacement happens in sedimentary deposits; we do not know that the friction in these cases produces volcanoes; and we do not know that cosmic bodies become reservoirs of heat at a depth of two-thirds of the earth's radius from the surface. This distance is about 2600 miles below our feet, and though it is arranged that heat may run up and down the radius at irregular distances, we cannot accept the arguments offered for this conclusion. We are told that the northern hemisphere, with its high mountains and great lands, is lighter than the southern with its great water areas. We are in a better position now than Gruithuisen was to show that the equilibrium of this earth, so wonderfully exhibited to us in all her motions, is equalled by the wonderful distribution of land and water. By referring to the deep-sea soundings of H.M.S. 'Challenger,' as published by the Admiralty for private circulation, we find that 227 soundings north of the Equator give an average depth of 1907 fathoms, and 208 soundings south of the Equator give an average of 1642 fathoms. The soundings between England and Gibraltar in the north, and those in the Straits of Magellan in the south, are not included. The deepest water in the north was 4575; in the south, 2900 fathoms. A very irregular bottom was noticed by the 'Challenger' between 46° and 64° S. latitude, and the 'Valorous' found a similar condition between 55° and 64° N. (*Geographical Magazine*, October, 1875). The deepest

soundings in these respective regions were 1860 fathoms north and 1800 fathoms south. The most northerly soundings, as given by Captain Markham, of the late Arctic Expedition in 83° 20′ 26″, gave a depth of 72 fathoms (chart, *Geographical Magazine*); and M. H. Woodward gives us a chart in the *Popular Science Review* for April 1877, showing dry land all round the Antarctic, and water all round the Arctic Pole. If Gruithuisen had known of this perfect and wonderful balance of elemental matter, he could not have used the argument for the scattering of heat up and down the radius.

The chemical differences mixed up with the volume and the density of earth in this section will be noticed presently. We now continue the Beginning. We are told that a relative fluidity of solids secures—

V. "A universality of drop form among celestial bodies. . . . . If the earth is the result of many successive aggregations, it follows that, the first nucleus being formed of small bodies of irregular shapes, the rounding-off process or mechanical liquefaction cannot have been considerable. The rough nucleus revolved, but, long before anything like a drop form was produced, a new piece of cosmic matter came to displace its centre of gravity and its axis of rotation. The rounding-off labour had to be commenced again, and in a new sense. Thus it must have happened that many interstices and clefts were covered or bridged over by new matter without being filled up, and it is highly probable that the part of the earth which is nearest the centre is its most cavernous and least compact part."

This is a curious passage from the pen of the German astronomer in working out details of his own gradual accumulation of matter. We have a parallel to it from the head of our present Physical School. Sir William Thompson is reported to have told his section of the British Association at Glasgow:—"We may be quite sure the earth is solid in its interior, not absolutely throughout its whole volume, for there certainly are spaces in volcanic regions occupied by liquid lava; but whatever portion of the whole mass is liquid, whether waters of the ocean or melted matter . . . . these portions are small in comparison with the whole; and we must utterly reject any geological hypothesis, which, whether for explaining underground heat, or ancient upheavals, or subsidencies of the solid crust, or earthquakes, or existing volcanoes, assumes the solid earth to be a shell of 30, or 100, or 500 kilometres in thickness, resting on an interior liquid mass." Sir William spoke confidently of the interior condition, having first acknowledged that he knew nothing below "one kilometre." Relying on the hypothesis of Laplace, he discards the "*interior liquid mass*," which must be there, if the nebular theory is true. Gruithuisen, relying on the mechanical results of his own ideal, produces heat in the unknown interior by forces dependant on his theory alone. These hot places are 2000 miles and more below us, his hollow places are more distant still; he gets his heat from the supposed falling together of these hollow places; but Sir William infers hollow places from volcanic action, and fills them with *molten lava* or *water of the ocean*. Let us see how Gruithuisen fills his.

VI. "Theoretically the remainder of the earth must be more compact, its ever-growing bulk enabling it to approach nearer and nearer to the drop form. We do not know how often or at what irregular intervals the earth was interrupted in its process. The probability, as well as the irregularity of these interruptions, justifies the belief that the whole interior of the earth (with the sole exception, perhaps, of the zone of maximum pressure), is full of hollow places, sometimes isolated, sometimes connected, all filled with gases or water, or emanations from surrounding rocks."

The German again loses his point of gradual collection, and refers to unknown interruptions in the making of his world, where no interruption could have taken place, if made by the coming together of cosmical dust from a universal disturbance. He had seen hollow places—there are plenty of them in the hills of Germany and Austria. He did not know much of the erosive action of subterranean waters on the sedimentary deposits of earth; but finding the hollow places in these deposits, he assumed that they must also be in the interior nucleus, of which he knew nothing. The filling of these imaginary hollows with gases, water, and emanations was the natural result of a limited experience. Gruithuisen contradicts himself, and the two philosophers contradict one another; but as neither of them knew anything of the interior, the contradictions are the almost necessary results of ideal explanations of the same phenomenon.

We now plunge into deeper water.

VII. "The earth attracted and assimilated not only solid bodies, but watery ones. The first water forming a primordial ocean found a very rough and irregular surface for its bed. It covered the whole . . . . and stood many miles higher than the highest peak of the Himalayas. In the initial irregularities of the water-bed is the true cause of the existing irregularities on the surface of the earth."

It will be shown presently that water could come without the attraction supposed by Gruithuisen; but we must return to this section again.

Gruithuisen required deep water to account for—

VIII. "Certain complete crystals . . . . and for boulders strewn on the plains around the Baltic; and having discovered that granite would remain suspended in sea water at a depth of 52 miles, he did not hesitate to accept such an ocean."

Dr. E. Gryzanovski is puzzled here, and asks, how could such an ocean disappear; the ideal replies:—

IX. "The process of aggregation going on throughout the universe, solar conflagrations must have been as frequent as planetary and cometary collisions, and their conflagrations must have been quite sufficient to deprive the earth and the other planets of any amount of water."

One monster ideal swallows another. Whatever the earth may know of local accidents now, we are not aware that it ever suffered from celestial conflagrations or collisions. Crystals do not require deep water for their formation, though some of them have been long in forming. The boulders on the present surface of the earth were not deposited by the water that surrounded its embryo. The water of the earth is not taken away from it now, though it may be transferred from one part to another. We know nothing of any water ever having been taken away from it without an equivalent return. We allow

that the ocean level was once higher than the Himalayas are now, but we do not require an ocean of water 52 miles in depth to satisfy any of the requirements of earth.

Dr. Gryzanovski thinks that "this theory contains much that may appear fantastic:" he believes in its essence. We put it down as an ingenious theory of a human being, on a par with the fire universe of Laplace, in which that astronomer did not entirely believe; and as on a par with the forty thousand mile-high mountain, which, believed in or no by its author, Buddah, has been accepted by millions as the hope of their morality and the summit of their ambitions. Man is always credulous—never more so than at the present moment; and if a tale is told with authority, few stop to probe its truth.

The MS. before us goes on with interesting details of earthly phenomena; they do not belong to the Beginning, but we hope to return to them. We have now to see what portions of these opposing theories will so amalgamate with recent discoveries, and known laws of nature, that all may fit together in one harmonious system, as far as it goes. It is possible that we may add one more link to the never-ending chain, assisting others to go on forging link upon link, till the final ring of the great far-off Beginning may be riveted on to the completed circle.

H. P. MALLET.

(To be continued.)

SIR ANDREW SCOTT WAUGH.

Two illustrious Indian surveyors have passed away from among us during the last month, Andrew Scott Waugh, and George Thomas Montgomerie—one almost in the fulness of time, and the other in the prime of life. Both were Gold Medallists of the Royal Geographical Society. Andrew Scott Waugh was the son of General Gilbert Waugh, the Military Auditor-General at Madras, and was born in 1810. He entered the corps of Bengal Engineers in 1827, became Garrison Engineer at Allahabad in 1830; and, when still a very young man, joined the Great Trigonometrical Survey, then under the able direction of Colonel Everest. His nomination was dated the 2nd of July, 1832, and his friend and contemporary was Thomas Renny, now Major Renny Tailyour, of Borrowfield, co. Forfar. The first work which was entrusted to the two zealous young officers, Waugh and Renny, was the exploration of the wild, jungly country between Chunar and the sources of the Son and Narbada, up to Jabalpur. They completed this service, and submitted a very interesting topographical and geological report in 1834, with coloured sketches of their route, the manuscript of which is still preserved in the Geographical Department of the India Office.

Their next work was of a far more difficult character. It was to assist Colonel Everest in the important operation of measuring the most northern base for the Great Arc Series, which was commenced in the end of 1834. The region selected for this measurement was the Dehra Dun, a beautiful valley between the Siwalik hills and the Himalayas. As soon as the base was measured, it was re-measured in reverse order by Waugh and Renny, the error being 2·396 inches in 7·42 miles. On the 1st of October, 1836, Colonel Everest took the field with both the large theodolites, dividing his staff into two distinct parties, under himself and Andrew Waugh. After two years of incessant work, Lieutenant Waugh was sent, in October 1838, to revise the angles in the Deccan, and he completed a series of triangles over a meridional distance of 260 miles, returning to Dehra in June 1839. To show the wonderful accuracy of these observations, it may be mentioned that the difference between the length of the Dehra Dun base as measured, and as computed by triangulation from the Sironj base, was 7 inches. In 1840, Waugh was engaged in fixing latitudes at stations on the Great Arc by observations of stars; and in 1841 he proceeded to re-measure the Bidar base. This brought to a close the operations for measuring the Great Arc Series of India, which extends from Cape Comorin to the Himalayas.

When Sir George Everest retired, in 1843, he recommended that his able and indefatigable assistant, Andrew Waugh, should succeed him. In doing so, Everest thus spoke of his successor:—"He is beloved and respected by all the subordinate members of my department, and held in honour and esteem by all who know him personally. His talents, acquirements, and habits as a scholar, a mathematician, a gentleman, and a soldier, are of a high order." In 1843, Captain Andrew Waugh was appointed Surveyor-General and Superintendent of the Great Trigonometrical Survey of India. His first work was to complete Sir George Everest's project for the triangulation of the important region between the Great Arc Series and Calcutta, and until 1848 he was engaged in the supervision of this work, and especially in fixing the heights of Himalayan peaks. The heights of 79 peaks were fixed, the loftiest of which, 29,002 feet above the sea, was well named by Colonel Waugh after his old chief, Mount Everest. It is still the loftiest measured peak in the world.

After the completion of this series, Colonel Waugh was free to undertake a work originated by himself, and the acquisition of Sind and the Punjab offered a vast field for fresh operations. He conceived a project for forming a system of triangulation to the westward of the Great Arc Series, to include the newly-acquired territory. His old friend and companion, Renny Tailyour, was with him when this work was begun, but he retired in 1849, on succeeding to his father's estate of Borrowfield. In 1851, Colonel Waugh superintended the measurement of the Chuch base in the Punjab, and in 1854 he saw the base at Karáchi completed. He took special pains in the preparation of the volume recording the measurement of the Chuch and Karáchi bases, and drew up a memorandum to serve as a guide for measuring future base lines. This volume, in manuscript, is preserved in the Geographical Department of the India Office. In 1856, Colonel Waugh instituted a series of levelling operations to determine the height of the base lines in the interior, commencing in the Indus valley, in 1858; and he also ordered the commencement of the survey of Kashmir.

Great progress was made in the Topographical and Revenue Surveys during the administration of Sir Andrew Waugh, who was admirably supported by Major Thuillier from 1847. In 1861 Sir Andrew published his *Instructions for Topographical Surveying;* and besides the Kashmir Survey, under Montgomerie, that of the Sind Sagar Doab, under Robinson, was due to the initiative of the Surveyor-General.

Sir Andrew Waugh became a Major-General and was knighted in 1861; and he retired in March of the same year, after having held the appointment for seventeen years. When he returned to England, he took with him the appreciative thanks of his Government, and the attachment of a splendid staff of surveyors who had been trained under his auspices. The whole staff, 191 in number, presented him with a service of plate in 1862. He had pushed forward the great work with such ability and energy that his successor, Colonel Walker, can see his way to its completion within a limited number of years. His labours were brought to public notice in several of the Annual Addresses of the Presidents of the Royal Geographical Society, and in 1857 he was awarded its Gold Medal. A history of the operations of the Great Trigonometrical Survey down to the time of Sir Andrew Waugh's resignation, compiled by H. Duhan, will be found in five articles in the

Professional Papers on Indian Engineering (vol. ii., pp. 285 and 398, and vol. iii., pp. 94, 305, and 402).

On his return to England, Sir Andrew Waugh became an active and useful member of the Royal Geographical Society, where his advice was most valuable in all matters relating to instruments and to Asiatic geography. He became a Fellow in 1857, and was a member of the Council from 1861 to 1872, holding the office of Vice-President during the last five years. In 1862 he was elected a member of the Geographical Club. He was also a Fellow of the Royal Society.

Sir Andrew Waugh was twice married, and had one son by his first wife, Gilbert William Renny Waugh, who entered the army in 1867, and is now a Lieutenant in the 78th Highlanders. For the last five years the health of the veteran surveyor had been failing. He was missed at his seat at the Council table of the Geographical Society, and still more was the absence of his genial smile and kindly greeting regretted by the Geographical Club. But his friends had the pleasure of seeing him at the Athenæum almost to the last. He died at his house, 7, Petersham Terrace, Kensington, on the 21st of February, 1878, at the age of sixty-eight.

COLONEL T. G. MONTGOMERIE.

AMONG the young surveyors who were trained under the auspices of Sir Andrew Waugh, there was none who did more admirable service in after life, and whose untimely loss will be more deeply felt, than the late Colonel Montgomerie.

Thomas George Montgomerie, the third son of Colonel Montgomerie, of Annick Lodge, and nephew of the twelfth Earl of Eglinton, was born at Ayr on the 23rd of April, 1830. Whilst at Addiscombe he gained the "Pollock Medal," awarded to the most distinguished cadet of the season, and he entered the East India Company's service, as a Lieutenant in the Bengal Engineers, on the 8th of June 1849.

Very soon after his arrival in India, young Montgomerie joined the Great Trigonometrical Survey, in October 1852; and in 1853 we find him assisting in the measurement of the Chuch base, near Attock. In 1854 he accompanied Sir Andrew Waugh to Karáchi, and took part in that base measurement from December 1854 until its completion on January 20th 1855.

As soon as this work was done, the survey of Kashmir, and of the mighty mass of mountains up to the Tibetan frontier, was commenced. Captain Montgomerie was only in his twenty-fifth year when this important and most difficult service was entrusted to him by Sir Andrew Waugh. He began work in the spring of 1855, and during the first season he carried the series across the Pir Panjal range into Kashmir. Two of the stations were 13,000 and 15,000 feet above the sea. Building materials had to be dug out of the snow for the station pillars, and the observers were detained at one station for twenty-two days, owing to snowstorms and foggy weather. Afterwards, as the party penetrated into the mountains, the height of the stations averaged 17,000 feet, and luminous signals were used from peaks 19,000 and even 20,000 feet above the sea. Between 1855 and 1861, young Montgomerie extended the triangulation over 93,000 square miles. One member of the party took observations from a station which was 20,600 feet above the sea, and marks were erected on peaks as high as 21,480 feet. Montgomerie fixed the height of a peak in the Karakorum range, temporarily called K. 2, which is second only to Mount Everest, having a height of 28,290 feet. This most difficult and laborious survey is remarkable for its accuracy, and in a circuit of 890 miles, only a discrepancy of $\frac{4}{10}$ of a second in latitude, and of $\frac{1}{10}$ in longitude, was found. The topographical filling in by plane table advanced with the triangulation, both being under the superintendence of Captain Montgomerie.

After ten years of uninterrupted labour in Kashmir, Montgomerie went home on leave; and on the 22nd of May 1865, Sir Roderick Murchison presented him with the Founders' Gold Medal of the Royal Geographical Society. The President said to him, on the part of the Council:—"When we reflected upon the remarkable facts that you had passed from the hot plains of Hindustan to the loftiest region on the face of the globe, and that there, amidst enormous glaciers, you had made accurate scientific observations at stations, one of which was 5000 feet higher than the summit of Mont Blanc, we could not fail to applaud and reward such noble feats, displaying, as they did, the great abilities and energy with which you conducted so arduous a survey."

On May 1st, 1867, Captain Montgomerie resumed his labours in India, conducting the Kumaun and Gurhwal survey, and executing a specially accurate survey of the hill sanatarium of Ranikhet.

But the work by which Colonel Montgomerie is most generally known among geographers, is that comprised in his system of employing native explorers to make discoveries in the unknown regions beyond the northern frontiers of British India. He hoped that by this means the whole country between British and Russian territories would be laid open. Natives are permitted to travel without molestation, as traders or in other capacities, through countries where Europeans would certainly be regarded with suspicion, and most probably would be murdered. Montgomerie's plan was to employ Pathans to explore the Hindu Kush, the valley of the Oxus, and Eastern Turkistan; while for the exploration of Tibet he engaged Bhutiyas and inhabitants of the upper valleys of the Himalayas within British territory. He taught them to make route surveys by taking bearings with a compass and pacing the distances; to take meridian altitudes with a sextant to determine latitudes; and to observe with a boiling-point thermometer. But he did not teach them how to reduce their observations, and they were not supplied with astronomical tables, in order that they might not be able to fabricate fictitious work.

There was great difficulty in training these native explorers, and there were many disappointments. Out of six or eight men that were instructed for years, only two or three turned out first-class observers. Nevertheless, this system resulted in the acquisition of a large amount of new information, and the work of "Montgomerie's Pundits" is well known to all geographers. They penetrated to Lhasa and the interior Tibetan lakes on one side, and to the unexplored regions of the Upper Oxus on the other. On his return, each explorer brought his crude work to Montgomerie, who reduced the observations, prepared the journals for publication, compared the work with all that was previously known, and finally completed a series of invaluable reports.

Colonel Montgomerie was senior Deputy-Superintendent of the Great Trigonometrical Survey, when ill-health obliged him to retire, to the great regret of the Department, in 1875. An appreciative notice of his services—by his colleague, Mr. Hennessey—appeared in the Annual Report for 1875-76, which we reprinted at page 123 of our number for May, 1877. Colonel Montgomerie became a Fellow of the Royal Geographical Society in 1865, and a member of the Geographical Club in 1873. He was elected a Fellow of the Royal Society in 1872.

The last time that he was officially employed was in 1875, when he acted as Her Majesty's Commissioner at the Geographical Congress in Paris. But his long and severe service had shortened his valuable life. He never seems to have really recovered after his return to England; and he died at Bath on the 31st of January 1878, leaving a widow and three children to mourn his loss. Their sorrow will be shared by many friends and admirers, both in this country and in India. The Indian Survey Department has lost one of its brightest ornaments, and all geographers will feel that a life has been cut short, which, had it been spared, would yet have done much precious service in furthering the objects of their science.

Reviews.

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THE VOYAGE OF THE 'CHALLENGER.'*

THESE two volumes contain Sir Wyville Thomson's account of the results of the voyage of the 'Challenger,' as regards the Atlantic Ocean. In his former volume—*The Depths of the Sea*—he gave a general history of deep sea investigations, and described with some minuteness the appliances and methods employed during the preliminary cruises of the 'Lightning' and 'Porcupine,' in ascertaining the exact depth, and in ascertaining the distribution of the deep-sea *fauna* by means of the dredge. *The Depths of the Sea* may therefore be regarded as a general introduction to the volumes giving an outline of the results of the 'Challenger' expedition.

In the present work Sir Wyville Thomson gives a very complete and detailed account of the equipment of the ship; and then conveys to his readers an excellent general idea of the results of the voyage, as regards the Atlantic, in an agreeably-written narrative. Thus, while the physical geographer obtains a good abstract of the data on which the conclusions and speculations of Sir Wyville Thomson and his colleagues are founded, the general reader is provided with an interesting account of the proceedings of an important expedition. The chapters describe the scientific work during the various sections of the voyage, from Portsmouth to Teneriffe, from Teneriffe to Sombrero, from St. Thomas to Bermuda, the Gulf Stream, from Bermuda to Madeira, from Madeira to the coast of Brazil, from Bahia to the Cape, and the voyage home. The final chapter summarises the general results of the expedition.

The Atlantic investigations disclosed the contour of the bed of that ocean, which has a mean depth of a little over 2000 fathoms, with an elevated ridge rising to about 1900 fathoms below the surface, and traversing the basins of the north and south Atlantic in a meridional direction, from Cape Farewell to as far south as Gough Island, following roughly the outlines of the coasts of the old and new worlds.

Except in the neigbourhood of coasts, where there is the *débris* washed down by rivers, the bed of the Atlantic, at depths between 400 and 2000 fathoms, is covered with the well-known calcareous deposit, the globigerina-ooze, which consists to a great extent of broken and decomposed shells of pelagic foraminifera. But everywhere in this ooze Mr. Murray detected fragments of pumice and other minerals due to the disintegration of volcanic rocks. These pieces of pumice are due to volcanic action, and have been washed and floated out to sea by rains and rivers, sinking to the bottom when they become water-logged. On several occasions pieces of pumice were taken on the surface of the ocean by means of the tow-net.

With reference to the distribution of ocean temperature, it was found that, throughout the whole of the Atlantic, the water was warmest at the surface, cooling rapidly for the first hundred fathoms; then cooling more slowly down to five or six hundred fathoms; and cooling extremely slowly to the bottom, or to a certain point from which it maintains a uniform, or nearly uniform, temperature to the bottom. The conclusion respecting currents, derived from the facts of temperature distribution, is that the entire mass of Atlantic water is supplied by an indraught from the southern sea, moving slowly northwards, and interrupted at different heights by the continuous barriers which limit its different basins. This involves the remarkable phenomenon of a vast body of water constantly flowing into a *cul de sac*, from which there is no exit; and Sir Wyville Thomson's explanation forms one of the most interesting passages in his concluding chapter.

As regards the distribution and nature of the deep sea fauna the most prominent biological result of the 'Challenger' investigations is the final establishment of the fact that the distribution of living beings has no depth limit. Animals of all the marine invertebrate classes, and probably fishes also, exist over the whole of the floor of the ocean; and some of the most important problems have reference to the nature and distribution of the deep sea fauna, and to its relation with the faunæ of shallower water, and of past periods in the earth's history. But as yet only an infinitesimally small portion of the floor of the ocean at depths over 2500 fathoms has been explored, while the critical study and determination of the animal forms which have been collected, has only just commenced, and will occupy several years. Meanwhile the present instalment of the results is very welcome to every student of physical geography. The two handsome volumes are illustrated by numerous maps, diagrams, and drawings of marine animals.

* *The Voyage of the 'Challenger'; a Preliminary Account of the General Results of the Exploring Voyage of H.M.S. 'Challenger' during the year* 1873 *and the early part of* 1876. By Sir C. Wyville Thomson, &c. &c. Two Vols. Macmillan and Co. 1877.

NATURAL HISTORY AND ANTIQUITIES OF SELBORNE.*

WE welcome with much pleasure Professor Bell's long-promised edition of *White's Selborne*. The delay in its appearance, though somewhat tantalising while it lasted, is the less to be regretted, as it is owing to the resolve of the editor to make his work as accurate and complete as possible. Gilbert White's natural history of his native parish has long since taken its place amongst our standard works, and its constant popularity is proved by the editions which follow each other with remarkable rapidity. Two somewhat pretentious ones have appeared in the last few years, but, till now, the charming edition prepared by E. T. Bennett, and published by his brother in 1837, has been undoubtedly the best. Professor Bell's, work, however, surpasses all its predecessors, and we heartily congratulate the veteran author on the completion of his labours. A more competent editor could not be found. An eminent naturalist, he is endued with that spirit of patient research and careful and accurate observation which was so re-

* *The Natural History and Antiquities of Selborne, in the County of Southampton.* By the late Rev. Gilbert White, formerly fellow of Oriel College, Oxford. Edited by Thomas Bell, F.R.S., F.L.S., F.G.S., &c., Professor of Zoology in King's College, London. Two Vols. (London: John Van Voorst, 1877.)

markable a characteristic of Gilbert White. For more than thirty years he has been owner of White's property, where for the last fifteen years he has entirely resided. He has thus carried out his own observations on the very same spot as his author, and has had opportunities of verifying the accuracy of the historian of Selborne, and of continuing and amplifying his observations which have fallen to the lot of no one else. This work is, indeed, a labour of love. It has been, we are given to understand, the delight of Professor Bell to gather round him every relic of White's that he could obtain, and to collect all the information that long and constant enquiry could recover respecting White's life, habits, and family.

Former editors were content to follow the brief biographical record prefixed by Gilbert White's nephew, John, to the edition of 1802, and made little effort to bring before their readers a clearer and better picture of the man who has already delighted three generations, and who, if one may judge from the increasing popularity of his book, will yet delight many more. Brief as John White's memoir was, it was yet not entirely accurate. He states that his uncle was *one of the senior Proctors of the University of Oxford*. Professor Bell shows that he was not senior but junior proctor; and though this error is a matter of little importance, yet its correction is a proof of the accuracy and research of the present edition. He has collected much new matter respecting his author which he has embodied in a very pleasing memoir, and the greater part of the second volume consists of a large number of original letters which he has obtained from various members of the White family. The greater part of these have never been published, and most of those that have been already printed have hitherto been inaccessible to the public. This correspondence brings the naturalist before us, occupied with his favourite pursuits as well as with classic literature, etymology, and poetry—not taking much notice of public events—superintending the education of his nephew *Jack*—full of interest in and kind thought for his relations and neighbours. Apart from Gilbert White, these letters have much general interest, as indeed the lapse of a century must always give to the letters of intelligent men. Observations constantly occur which are of value in comparing our own age with his. To take one instance, the effect of the long, dry spring of 1776 was to raise the price of butter to 10*d*. per pound, and of hay to 4*l*. 10*s*. per ton. How many housekeepers would welcome such *famine* prices now! The letters, too, illustrate the principal work in many ways. In 1776 we find White writing to his brother-in-law, Mr. Barker—"When I opened your letter all the *Parnassia* seed fell out, and I took it to be dust and dirt from the pocket of the person who brought it, but luckily it fell in my lap, so that I saved it all. I shall sow it soon in the sandy bogs, and see if I can succeed better." He does not include the grass of Parnassus in his list of the more rare plants found within his limits. In the much more extended list given by the present editor this plant is stated to have been found at one place only, Oakhanger, by Lord Selborne, and by no one else. Is it not possible, or even probable that Lord Selborne's discovery is the descendant of Mr. Barker's seed?

White was no recluse: he seems to have moved about as much as most persons of his position did in that age of much more limited locomotion. After he succeeded his second cousin and uncle by marriage, the Rev. Charles White, in the property at Selborne in 1763, he not unfrequently went to town; his Fellowship at Oriel took him at stated times to Oxford; he visited friends in Sussex; and his own house, *The Wakes*, seems to have been constantly filled with friends and relations. It was doubtless his love of hospitality which led him to add considerably to his house. He was in constant correspondence with a number of persons, several of them, besides Tennant and Daines Barrington, literary and scientific characters. He never ceased performing the sacred duties of his profession, and at the time of his death was acting as curate of Selborne. Can it be necessary here to contradict the vulgar notion that he was ever vicar of the parish?

The notes to the present edition are such as we should have expected from the editor; he wisely determined not to treat at large of the general history of the various objects referred to in the original work, but rather to render as correct and complete as lay in his power the text of Gilbert White. He has thus avoided encumbering and confusing the text with a mass of other matter, the one fault of Bennett's edition. The lists of the fauna and flora of Selborne and its neighbourhood have been much amplified. The editor has given us some pages of White's quaint, full, and methodical account-books, which are not only a help in forming an idea of White himself, but are certainly a valuable contribution to the domestic history of that time. The engravings, mostly from Professor Bell's own photographs, are good and appropriate.

We have confined our observations to this *new* edition, and have not treated of Gilbert White's original work: that, surely, is well known to our readers! If there be any who are not already familiar with it, we recommend them to lose no time in making themselves acquainted with a book which its merits, both of style and matter, have justly established as an English classic, and which they cannot read in a more agreeable form than that now presented to the public by the editor.

HISTORY OF THE INDIAN NAVY.*

IT is strange that in a maritime country like England, the history of this small but brave service, with which some of the most stirring achievements of Indian history are bound up, should have so long remained unwritten. The Indian Navy had its origin in that small fleet of "grabs" and "galivats," whose seamen in the early days of the Company protected the factory of Surat and their trading vessels from pirates or the fanaticism of wild Mahrattas. Little by little did this tiny fleet develop into the dimensions of a navy, which was the terror of the pirate swarms in the Persian Gulf and China Sea, and whose hydrographical labours from the Gulf of Pechili to the Red Sea have proved of no small advantage to all navigators down to our own times. It needs but a glance at Lieutenant Low's very full work to show how rich

* *History of the Indian Navy* (1613—1863). By C. R. Low, Lieutenant (late) I.N., F.R.G.S. London: Bentley. 1877.

a mine of adventurous history he has hit upon. The surveys of the old Indian Navy had indeed been succinctly but ably narrated in Mr. Markham's *Memoir on the Indian Surveys*, but of the exciting conflicts in which Indian Navy vessels were continually being involved, whether with the Portuguese, Dutch, or French, or with the savage pirate crew infesting the Indian and Arabian Seas, no continuous history has hitherto been presented to us. Of these and other memorable exploits a most graphic and absorbing narrative is now furnished to us, and the quick succession in which these incidents are reproduced serves to give Lieutenant Low's work the air of a narrative of exciting adventure rather than that of a sober history. We do not, however, mean this in disparagement of a work which, as a naval history, must necessarily deal largely with such events. Amid so many stirring scenes it is difficult to pick out one as more worthy of notice than others, but the reader will find the description of the operation against the Joasmi pirates especially interesting (*vide* Chapter X.). One incident in the attack on Ras-ul-Khymah deserves being singled out, so eminently characteristic is it of the British Jack Tar. The story is borrowed from an officer who was present:—

"Towards the afternoon of the 8th, and during the hottest of the cannonade, a bullock and a white cock were descried close under the wall of the town, exposed to the showers of shot from our batteries, from which they remained unharmed. The attention of several of the men was called to these objects. 'What a —— fine mess they would make!' shouted out one of the sailors. 'Bill, I say, you bear a hand with me in towing them things out.' Over the trenches both of them vaulted, and scampered away at a slapping pace towards the ramparts, heedless of the balls plunging around them. We slackened our fire as speedily as possible, the men in the trenches cheering and exulting in the boldness of the enterprise. The Arabs crowded on the walls, firing their matchlocks with steady aim at the two fellows, as one of the sailors coolly drove the bullock towards us, whilst the other, after a sharp chase, captured the cock. They returned to the trenches, loudly huzzaed by their comrades."

An amusing incident, which officers, vexed in their souls by excessive red tape, will fully appreciate, is related *àpropos* of the arrangement by which the administration of the Indian Navy was subject to the control of a Military Board and Audit Department. This board, noticing in the audit of the expense and supply books of a certain master, that the main-topsail yard was "carried away," immediately concluded, in the plenitude of their wisdom, that some one had clandestinely walked off with it, and read the master a strict lecture on the impropriety of permitting any article the property of Government to be carried away without proper authority.

A considerable portion of the present work is devoted to the valuable hydrographical labours of the Indian Navy, of which the author has given us a careful and detailed account, some of the particulars being new, and of special interest. In referring to these and other passages in the work, we are constrained to observe that the want of an index detracts from its usefulness.

We have only one fault to find with this book. It is too much spun out. The author has industry, and a capacity for research; but he does not seem to have the knack of extracting the pith of such documents as come before him. It is certainly better to have too much than too little; but the constant repetition *in extenso* of the Government orders on such-and-such an occasion (documents of a colourless and depressing nature at the best of times) have served to swell the book beyond convenient dimensions. When this practice culminates in the immortalisation of a round-robin, penned by the passengers of one of the P. and O. Company's vessels, and expressing their contentment at things in general, including a passage tolerably free from the bodily discomforts of the sea—which effusion is printed in its entirety, barring the signatures of the eleven ladies and twenty-seven gentlemen passengers on board—the reader will infallibly protest.

It is impossible to refrain from a few reflections on the policy which advocated the abolition of the Indian Navy, and on which Lieutenant Low, as might be expected, animadverts pretty strongly. Sir Charles Wood bears a high name as an Indian administrator; but whether it be the irony of history or not, his abolition of the Indian Navy has certainly proved an unfortunate step. The fact is, that India is too big an entity to be placed under the wing of England, as regards its naval or other requirements. A dozen years had not elapsed since the functions of the old Indian Navy were formally handed over to the Admiralty before it became evident that India would have to see to matters herself if she wished them properly looked after. Accordingly a new Department, charged with the care of marine matters in general, and another one with that of marine surveying, have been organised; while, as regards defensive purposes, it has been found necessary to provide two monitors, at the sole expense of Indian revenues, for Bombay Harbour. A germ is thus forming which may eventually develop into something like the Indian Navy of former days; but we fear it will be some time before the *esprit de corps*, the experience, and the traditions of the old service will be grafted on to the coming one. In the meantime, no better service could have been done to the cause than Lieutenant Low has done by the publication of the two volumes before us. They contain a mass of most interesting matter, in the treatment of which the author's best qualification has been his warm love of the subject.

PIONEERING IN SOUTH BRAZIL: THREE YEARS OF FOREST AND PRAIRIE LIFE IN THE PROVINCE OF PARANA. By *Thomas P. Bigg-Wither*, Assoc. Inst. C.E., F.R.G.S. Two vols., with Maps and Illustrations. (Murray. 1878.)

THE author of this work was engaged on an exploring staff, under the direction of Captain Palm, an officer in the Swedish army, who had obtained support for a plan of opening a road through the centre of the South American continent. The preliminary difficulties had been overcome, the Brazilian Government had approved of the plan, and the Viscount Mauá, the chief capitalist of Brazil, had given it his support, when Captain Palm sailed from Liverpool with his staff in 1872.

The region which Mr. Bigg-Wither describes is that part of South Brazil which lies between the Atlantic coast at Paranagua, and the River Paraná. It is almost entirely included within the valleys of the two rivers, Tibagy and Ivahy, tributaries of the Paraná, and the western part consists of wild and unexplored forest and prairie. Our author landed at Paranagua, and proceeded thence to Curitiba, the capital of the Province of Paraná, which was the starting-point for exploration.

His accounts of camp life, of hunting excursions and boat voyages, of adventures by flood and field, and of the wild Coroado Indians, are well and pleasantly written, and convey much new information.

In the second volume Mr. Bigg-Wither gives some account of the English colony of Assungui, north of Curitiba, on the River Ribeira, which flows direct to the Atlantic. The colony was commenced about ten years ago, but, owing to various causes, it does not contain a single successful emigrant. The failure is due to two causes, the hard conditions imposed by the Brazilian Government, which alone makes success impossible, and the character of the emigrants, who are town-bred men and not agricultural labourers. The site of the colony is also badly chosen, the ground being too steep for ploughing, and there being no pasture for mules within reasonable distance.

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SPICILEGIUM FLORÆ MOROCCANÆ, by *John Ball, F.R.S.* ("Journal of the Linnæan Society," vol. xvi. No. 93., p. 281).

THIS interesting paper, by Mr. Ball, is the first fruits of the journey to Morocco undertaken by Sir Joseph Hooker, Mr. George Maw, and the author in 1871. After three days passed at Tangier, during which an excursion was made to Cape Spartel, the party proceeded to explore the neighbourhood of Tetuan, and arrived at Mogador on the 25th of April, whence they rode to the ancient capital of Morocco. On the 8th of May the travellers made their way from Morocco in the direction of the chain of the Great Atlas, which rises in full view of the city, with the intention of studying its flora. In spite of much opposition from the escort, they succeeded in ascending to a considerable height. Mr. Maw alone reached the actual crest of the ridge, about 11,500 feet above the sea. They also made another excursion into the interior of the range, and on May 23rd they ascended a summit called Djebel Tezak, whence they had a view of the great valley of Sous, and of the parallel range or Anti-Atlas, some 60 miles distant. On June 3rd they returned to Mogador. In the present paper, before the "Enumeratio generum ac specirum," Mr. Ball gives a most interesting account of the Morocco flora in its bearings on the floras of surrounding regions.

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I. VIAGE A LA PATAGONIA SEPTENTRIONAL. Memoria leida el 14 de Marzo en la Sociedad Cientifica Argentina, por *Francisco P. Moreno.* (Buenos Ayres, 1876).

II. INFORMES DEL SEÑOR DON FRANCISCO P. MORENO, AL MINISTRO DE RELACIONES ESTERIORES. (Rio Santa Cruz, Dec. 26, 1876.)

IN the first of these papers Señor Moreno gives an account of a journey of exploration in the northern part of Patagonia, which he made in the footsteps of Villarino, Cox, and Musters, from 1873 to 1876. On the 18th of October 1873 he reached Carmen de Patagones, on the Rio Negro. Thence he travelled on to the Lake of Nahuel-huapi, making large geological and ethnological collections, and learning much respecting the various tribes in this part of Patagonia.

The second paper is a report by Señor Moreno to the Argentine Minister of Foreign Affairs, on his visit to the River Chabut, which falls into the Atlantic on the east coast of Patagonia, and to the River Santa Cruz.

DR. E. T. HAMY has published, in the *Bulletin* of the French Geographical Society, the exhaustive paper read by him before the Society last year on certain old maps of New Guinea, which illustrate the discoveries made by the Spanish navigators between 1528 and 1606.

Cartography.

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Maps of Spitzbergen.*

THIS is the title of the valuable paper written by Captain de Bas, explanatory of a series of Maps of Spitzbergen, published by the Dutch Geographical Society. It was considered that these maps would show not only how much the Dutch had done in the Arctic regions, but also the confusion caused by the constant changing of names on successive maps. In comparing the ancient maps of Spitzbergen, the same place is often found to appear under several different names. Captain de Bas suggests that there should be two international rules in geographical nomenclature. First, that any newly-discovered place should have the name used by its inhabitants; and, second, that when there is no such name, it should always be known by that given by its first discoverer.

The first map shows the track of William Barents, in 1596. It was engraved by a Dutchman named Baptista A. Doetechem, in 1598, and adapted by Judocus Hondius, in 1611. A reproduction of this map appeared in a later edition of De Veer (1598), a copy of which is in the British Museum. The map is also in the original edition of the *History of Amsterdam*, by Pontanus (1611), the reproduction being the work of Hondius. It is repeated in Mr. Asher's *Henry Hudson*, a volume belonging to the Hakluyt Society's series. Hondius was the most celebrated geographer and engraver of his time. On this map Spitzbergen is called "Nieu Land."

Captain de Bas's second map is that of Hessel Gerritz (1612), the cartographer to the Dutch East India Company, and a very eminent geographer. It is here that the word Spitzbergen first appears: "Nieu Lantd autrement dit Spitsberghe." Here also Jan Meyen Island appears as "Hold with Hope;" it should be "Hudson's Tutches." The northern coast of Spitzbergen is not given.

The third map is that of Thomas Edge (1625), which is bound up in Purchas. It was reproduced in our number for March 1873 (facing page 388), and also in the first edition of *The Threshold of the Unknown Region* (p. 51).

The fourth map is one by M. H. Middelhoven (1634). It is mentioned in the catalogue of the collection in the archives at the Hague, but has never before been reproduced. Here we have "Het Nieuwe Land, Spitsberghen."

On the fifth sheet there are three maps of later date, yet of less value. One has the title "Delineatio Spitsbergiæ (1642). The second is "'T Land Spitsbergen" (1648); and the third is a small-scale sketch, with the date "eerste jaren van de tweede helft der 17 eeuw," or, more briefly, 1651. The names are English, and it seems to be mainly copied from the map in Purchas.

The sixth map is well known. It is that of Joannes van Keulen (1710), which we reproduced in our number for March 1873 (facing p. 388), and also in the first edition of *The Threshold of the Unknown Region* (p. 59). It is curious that the name of Smeerenburg, so long frequented by the Dutch whalers, should be omitted by Van Keulen.

The seventh and last map is that which was compiled under the direction of Dunér and Nordenskiöld in 1864.

The series will be of great use to comparative Arctic geographers, and Captain de Bas has done very good service in preparing it for publication, its value being much enhanced by his able explanatory memoir.

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* *Het doopregister van Spitsbergen volge us reisjournalen en Kaarten.* Door F. de Bas Kapitein van den Generalen Staf (Met Zeven Kaarten).

New Map of Madagascar.

MUCH has been done of late years towards improving and correcting our geographical knowledge of Madagascar, especially by Dr. Mullens and other missionaries. The coast was laid down by Captain Owen and his officers in 1824, and the delineations of the interior, until quite lately, were based on a map by Colonel Lloyd, which was published by Mr. Arrowsmith in 1851. M. Grandidier, who was in Madagascar from 1865 to 1870, mapped considerable tracts; and a further important contribution was made by Dr. Mullens in his Map of the Central Provinces of Madagascar, published in the 45th volume of the *Journal of the Royal Geographical Society*.

The map now before us, which is very creditably executed, has been compiled from materials furnished by the work of M. Grandidier, Dr. Mullens, Mr. Houlder, Bishop Cornish, Sewell, Sibree, Shaw, Moss, Grainge, and from observations by William Johnson. It was copied for transfer by Rajesima, a pupil trained in the Mission School, and lithographed at the Mission Press at Antananarivo. The map is dedicated to Ranavalomanjaka, Queen of Madagascar, and to Rainilaiamanjaka, the Prime Minister.

Stanford's Stereographical Map of the British Isles.

MR. STANFORD has published a map of the British Isles, on a scale of $\frac{1}{1,584,000}$, constructed to show the correct relation of their physical features. The map is tinted, and the hills are shaded with great care, in order to indicate clearly and accurately the relative elevations as well as the steepness of the ranges. An admirable orographical map is thus produced which must be of great assistance to geographical students; for it is extraordinary the assistance that such cartographic illustration affords in acquiring a correct notion of the physical aspects of any country. For example, it would need a long description to convey an accurate impression of the relations between the Pentland, Lammermuir, and Cheviot Hills, which on Mr. Stanford's map are graphically shown at a glance.

Log Book.

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Reported Existence of Relics of the Franklin Expedition.—In 1876 Mr. Barry was serving on board an American whaler, belonging to the firm of Morrison and Brown, of New York. When off Whale Point, at the entrance of Sir Thomas Roe's Welcome, a party of Eskimos came on board, who arrived from what Mr. Barry called Cape Inglefield, 3 miles north of Whale Point. Here there is clearly some mistake, as there is no Cape Inglefield in the position indicated. The whaler subsequently wintered at Marble Island, south of Chesterfield Inlet, and a good deal more was seen of the same Eskimos in the following months. They said that a party of white men (from Franklin's ships) came to their village, called Nachili, and that they all died during the winter, having previously deposited books in a cairn, which has remained undisturbed. The Eskimos offered to conduct Mr. Barry to the spot, but he was unable to undertake the journey, and returned home with this story to his employers. Messrs. Morrison and Brown intend to send Mr. Barry this year, in a schooner called the 'Eothen,' to visit the spot indicated by the Eskimos, and investigate their story

It is possible that there may be something in what the Eskimos assert, and the question ought certainly to be well sifted. A very absurd letter on the subject recently appeared in the *Times*, in which it was assumed that the cairn in question was near Cape Inglefield, at the western entrance of Hecla and Fury Strait. The mention of Cape Inglefield was merely an error of Mr. Barry's, and has no bearing whatever on the position of Nachili, which is more probably on the line of the Wager river.

Professor Nordenskiold's approaching Arctic Voyage.—Professor Nordenskiöld has written an exhaustive report on his approaching expedition along the northern coasts of Europe and Asia. He considers that the best route into the Sea of Kara is by way of the Matochkin Straits, as the ice gets broken up there tolerably early in the season, and there are good harbours on the eastern side. From thence to the Yenisei mouth, a circuitous route to the southward is often necessary to avoid the large masses of floating ice, with which the Sea of Kara is encumbered until the beginning of September. The Professor expects to reach Port Dickson, at the mouth of the Yenisei, about the first few days of August. From thence to the eastward our knowledge of the coast is very meagre. In 1740, Minin reached 75° 15′ N. latitude in a sloop, but was unable to explore after the 2nd September, "the season being too far advanced." Middendorf, in 1843, was informed by the Yakut Fomin, who had passed a winter in Taimyr Bay, that in the first half of August the ice gets driven by the south wind right out of sight of land. Cheliuskin surveyed the coast line between Taimyr and Cape Cheliuskin in sledges in May 1742, when the sea was frozen hard. Pronchichef, on the 1st September, 1736, advanced through open water nearly as far as Cape Cheliuskin, and Norwegian whalers have advanced to about the same latitude and 68° E. long., without meeting with ice. The Professor considers that the warming influence of the Great Siberian rivers must be very considerable, as he found the temperature of the current in the Yenisei as high as 9° 4′ centigrade, and that of the Ob 8°, in the month of August. The only maritime gulf which is at all comparable with the Sea of Kara is the Gulf of Mexico, and it is known that there the force of the rivers is supposed to contribute largely towards the power of the Gulf Stream. As regards the sea eastward of Cape Cheliuskin, it was navigated by Russian expeditions in the last century; but though conducted with great resolution and courage, the sailing-vessels were too small, and manned by too inexperienced sailors, to achieve much, though they, too, seem to demonstrate that the sea is navigable during autumn. Both Pronchichef and Laptef, although greatly hindered by contrary winds, succeeded in reaching very nearly as far as Cape Cheliuskin; so it may be presumed that a well-appointed steam-vessel would have but little difficulty in doubling the cape.

With reference to the portion of the coast between the Lena and Behring Straits, there is much more information extant. From the middle of the seventeenth century the hope of doing a profitable trade or levying dues on the tribes inhabiting the coast, induced the Russian whalers to undertake many expeditions along it. On a map based on information in the Siberian archives, and attached to Muller's work, there is a route drawn along in that direction, with the words, "Route much frequented in former times, and undertaken in 1648 by three Russian vessels, one of which reached Kamtchatka." Of most of these expeditions, however, details are wholly wanting, although, owing to litigation regarding some of the discoveries made, Deshnef's expedition in three ships, in 1648, from Kolyma to the Anadyr river, has been chronicled with more exactness. After the foundation of Nishni Kolymsk, in 1644, many voyages were undertaken from the Siberian rivers, but the leaders of these were afraid of ever venturing far from land. Hedenstrom's expedition to the New Siberian Isles, in 1809-11, and Lieutenant Anjou's, in 1823, furnish little or no information regarding the navigability of the sea during the autumn. Sonnikof,

an inhabitant of Yakutsk and companion of Hendenstrom's, made a remarkable discovery in 1811. He found on the western side of the Island of Kotelnoi a winter hut, close to the remains of a vessel of a different construction from those of Siberia. He concluded, from several minor circumstances, that some seal-hunter had been driven thither from Spitzbergen or Novaya Zemlya.

Although Deshnef's expedition had established the existence of a strait between Asia and America, his discoveries were lost sight of, and the matter was not considered proved till Behring's voyage. Since Cook's voyage, in 1778, the whaling expeditions of Rodgers and Long have both demonstrated the probable navigability of the sea, and this opinion is borne out by private information derived by Professor Nordenskiöld from Yakutsk. His general conclusions are that the ocean north of Siberia has never been traversed by a perfectly seaworthy vessel, and still less by a steamer built for Arctic work. The small sailing vessels which have journeyed there have never ventured far from land, and have always retired into winter quarters at the end of the summer, the best time for navigation. A well-appointed steamer, he considers, would find no insuperable difficulty in traversing this route, from Cape Cheliuskin to Behring Straits, in one season.

A Canadian Geographical Society has been established in Quebec and the opening meeting took place on the 22nd December, under the presidency of Dr. Fortin, who, in his opening address, made mention of the natural resources of Canada as forming a legitimate subject of enquiry for the Society, and referred specially to her fisheries and forests as of great economic importance, and the more so, as those of the United States had, in some instances, been completely exhausted.

Further Exploration of the Darien Isthmus.—In our numbers for February, June, and October 1877, pp. 45, 162, and 276, we gave some account of the surveying expedition under Lieutenant Wyse. That officer returned to the isthmus on the 28th of last November. On the 8th of December he and his party left Panama, with the intention of thoroughly examining the various routes which have been mentioned as practicable for a ship canal between the Atrato and Panama. The party consisted of Lieutenant Lucien N. B. Wyse himself, and M. M. Reclus, P. J. Sosa, Lecharme, and Pouydesseau. Their first destination was Chepigana, whence they carefully examined the Chucunaque and Gandi. Then they proceeded to explore the Bayano route, as well as all the intermediate country. The examination of the Bayano route tended to confirm the report of Commander Selfridge, U.S.N., that a tunnel over 7 miles long would be necessary in opening a ship canal at that point. By the latest news the members of the expedition were in good health, and satisfactory progress was being made in the important work under Lieutenant Wyse's direction.

The New President of Colombia.—Ignorant newspaper writers in this country are never tired of talking contemptuously of the unceasing revolutions in South American States. In Colombia (formerly New Granada) there has never been a single successful revolution since the declaration of independence. The priests instigated a rebellion which broke out in July 1876, but it was put down, and peace was restored by General Trujillo in March 1877. Don Aquileo Parra, a merchant of Velez, became President in April 1876, and served his regular term of office for two years. In April 1878 he will be succeeded by General Julian Trujillo, who will hold the office of President of Colombia until April 1880. Julian Trujillo was born at Popayan on the 28th of January 1828; he was educated in the university of his native town, and became an advocate and a politician. Under General Mosquera the rising statesman not only acquired experience as a Finance Minister, but also learnt the art of war. In 1863 he had acquired the reputation of being one of the ablest generals in Colombia. He has twice been President of his native State of Cauca, and he displayed great ability and skill in quelling the late priestly rebellion. Last September he was elected President by all the nine States which compose the Federation. General Trujillo is now engaged in examining the line for an important projected railway from Buenaventura to Cali.

Statistical Department in Peru.—The creation of a central Statistical Department in Peru, under the auspices and with the co-operation of the Government, has at length been secured. Don Manuel A. Fuentes, the accomplished author of the *Sketches of Lima*, the English version of which was published by Mr. Trübner in 1866, has been selected as the Director of this useful department. No better choice could have been made. The new Director has entered upon his duties with a full knowledge of the requirements, and of the immense difficulties to be overcome, especially as regards the absence of all local machinery for the collection of statistics. His plan is to establish, in all the provinces of Peru, special Statistical Commissions, which, with the co-operation of the local authorities, but independent of them, will undertake the collection, and regular transmission to the central office, of the required information. Dr. Fuentes is also devoting much attention to the elaboration of suitable machinery for taking the next census.

Recent Earthquake and Flood in Peru.—On the 2nd of December 1877, at 4.27 P.M., there was an earthquake at the city of Chachapoyas, in the valley of the Upper Marañon, the shock lasting twenty-five seconds. From 1.30 P.M. the sky was overclouded; at 4 there was a violent storm of rain, with lightning; and a few minutes after the rain ceased the shocks of earthquake began. The duration of the shocks and the rapidity of the oscillations were quite exceptional, the oscillations being from north to south. Many buildings were destroyed.

On the 20th of December there was a great inundation at Tarma. The river traversing the town became so much swollen, in consequence of a heavy storm, that it overflowed its banks, and inundated a large part of the town, as well as several estates and villages in the neighbourhood. All the crops of Collana and Acobamba were destroyed, and a wide extent of country was devastated. No such inundation has been experienced at Tarma for fifty years.

Piaggia's Explorations in the African Lake Region.—Signor Piaggia, who left Dufli, in Equatorial Africa, in company with Cavaliere Gessi, on the 7th March, 1876, for Lake Albert Nyanza, has furnished a brief notice of his own exploration of Lake Kapeki, or Ibrahim, which is reproduced in the *Bolletino* of the Italian Geographical Society for October last. He reports that he has discovered on the eastern coast of this lake a new outlet, about 60 yards wide, and called Massanga, which, according to the natives, loses itself in extensive marshes to the north-east of the lake, after a brief course. The lake itself, originally discovered by Colonel Long-bey, in 1874, is about 35 miles long and 15 miles wide, and varies in depth between 6 and 30 feet. It is tenanted by plenty of hippopotami and crocodiles, and the surrounding country abounds in large snakes, such as pythons, boas, &c. Otters, too, are plentiful, and are hunted by the natives for the sake of making carpets of their skins. The locality is extremely unhealthy, owing to its marshy nature, and Piaggia's followers suffered greatly from fever. On returning to Mruli, Colonel Gordon's station, situated about 30 miles west of the lake, Piaggia met some of King M'tesa's dragomans, who gave him a great deal of information about the topography of the surrounding country, and told him that about a month previously (*i.e.*, about the 24th of May, 1876), Mr. Stanley had

departed towards Bezebat, to the south-west of Lake Victoria Nyanza, in search of a copper-mine, of which he had heard from native report.

Death of Captain Elton.—We regret to have to record the death of this intrepid explorer on his way from the head of Lake Nyassa to the coast. Captain Frederick Elton first became known to geographers through his exploration of the Limpopo river in 1870. His paper on the subject was read at a meeting of the Geographical Society on November 13th, 1871, and published in volume xlii. of the *Journal* (1872). He descended the Limpopo as far as the confluence of the Lipalule river, and thence struck across to the Portuguese town of Lorençq Marques, in Delagoa Bay. It fell to the perseverance and good fortune of Mr. St. Vincent Erskine to carry down the Limpopo from the junction of the Lipalule to the sea. While Sir Bartle Frere's Mission was engaged in visiting Mozambique and other ports to the southward, Captain Elton arrived at Zanzibar; and he afterwards wrote a narrative of his trip, in a series of letters to the *Natal Mercury*, which were reprinted at Durban in a separate form in 1873. In these letters he gave an interesting account of Mozambique, Zanzibar, Mombas, and Kilwa (see our number for January 1874, p. 427). He also contributed a paper on the same subject, and describing the copal districts south of Dar-es-Salem and the Rufiji river, which he ascended with Lieutenant Pullen, of H.M.S. 'Shearwater,' to the *R.G.S. Journal* for 1874 (vol. xliv., p. 227. See also our number for April 1874, p. 181). Captain Elton became First Assistant to the Political Agent at Zanzibar, and was afterwards appointed H.M. Consul at Mozambique. Here he had excellent opportunities of achieving further geographical work; and we sincerely regret the untimely death of this gallant young explorer.

Death of the Belgian Explorers.—In our number for November 1877 (p. 304) we announced the departure of the Belgian Expedition for the Exploration of Central Africa, consisting of Dr. Maes and Captain Crespel. It is now our duty to record the death of these two gentlemen of fever, at Zanzibar. They were seen by Mr. Stanley when he was at Zanzibar, on his way home, full of zeal and energy; and the sad news will have been startling in its suddenness. The King and people of Belgium will have the warm sympathy of all geographers in their loss.

Life of Captain Flinders.—We are glad to be able to announce that Mr. John J. Shillinglaw, who is now residing at Melbourne, is engaged upon a Life of Captain Flinders, the explorer of the coasts of Australia, under whom Sir John Franklin served. Mr. Shillinglaw is favourably known as the author of *A History of Arctic Voyages*, which was published just before the departure of the expedition of 1850-51. He has very diligently collected materials for his biography of the illustrious Australian navigator from colonial records and numerous other sources, and has now been engaged on the work for some years. Through the aid of Sir Henry Barkly he has also discovered a fine portrait of Flinders; and if all goes well, the work will go to press in the present year.

Travels in Western China.—Mr. Baber, of the Chinese Consular Service, has recently tracked the course of the Yang-tze river from near Tung-chuan to Pingshan. No European had ever been in the region before, and the course of the river (there called the Gold river) is altogether incorrectly laid down on the Jesuit maps. A line drawn south-west for a mile or two above Pingshan will, according to Mr. Baber, indicate its general direction. He describes the country as the wildest and poorest imaginable. Lieut. Gill (who accompanied the mission) appears to have traversed over much of the same ground in the northern part of the province as did the Père Armand David and Mr. T. T. Cooper in their respective journeys.

Correspondence.

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THE COUNTRY ROUND LAKE NYASSA.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

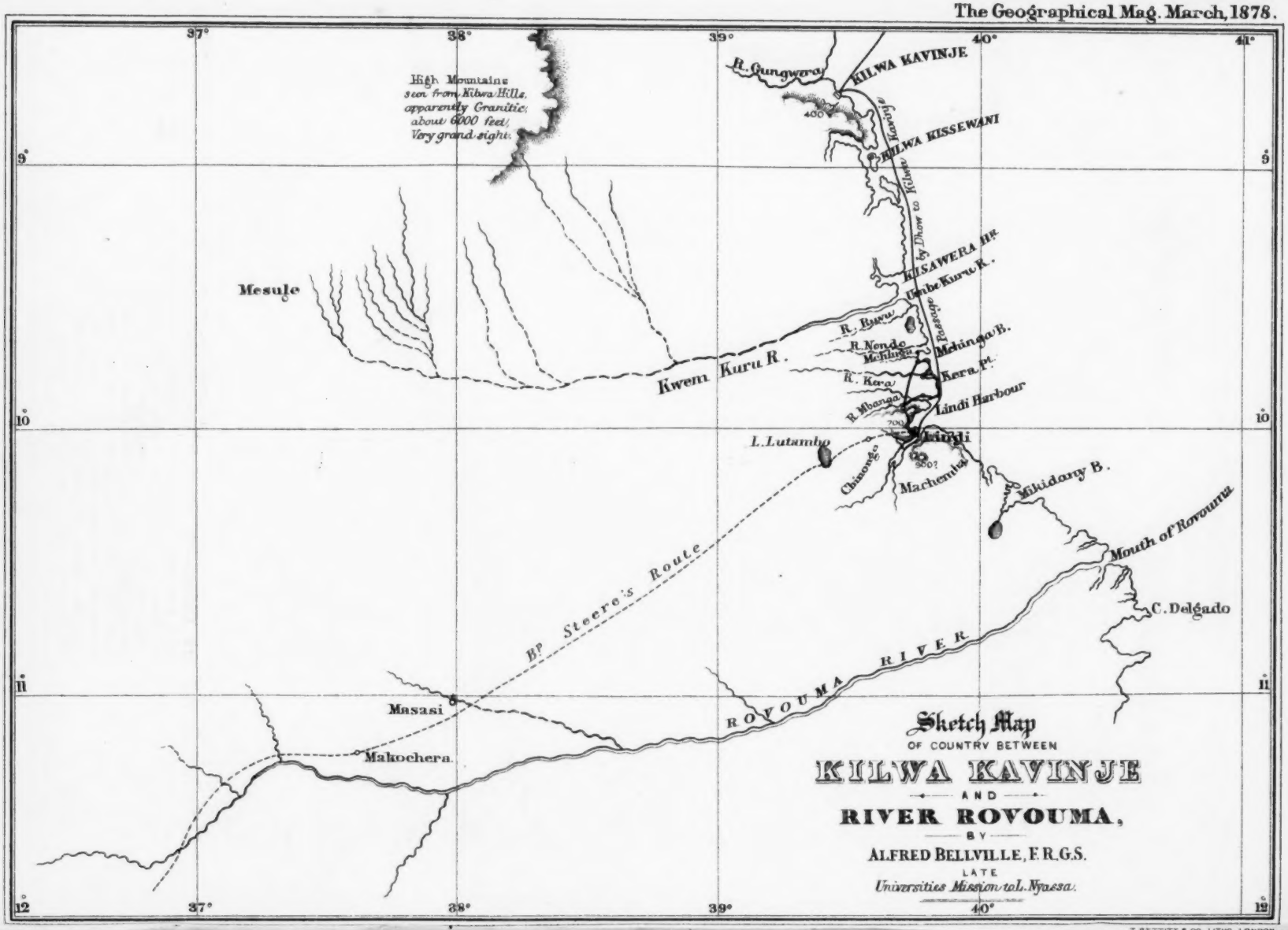
SIR,—As one of the members of Bishop Steere's original party for mission work in the vicinity of Lake Nyassa, I beg to offer a few corrective remarks, accompanied by sketch map, on the "Map of the Country Round Lake Nyassa," by Keith Johnston, F.R.G.S., in the August number of the above magazine.

There is no large river running into Lindi Harbour: river is a misnomer, as it is only a salt-water inlet, with two mountain torrents emptying themselves into it. According to native report they are respectively two hours and one hour long, or about 10 and 5 miles.

This would have been self-evident, I mean as to the large river, had Mr. Johnston been aware that the Nyassa road from Lindi led over the hills at the back or west of the town round the end of the arm that comes from the north-west, and so on trending towards the Rovuma. Had the river been there, Bishop Steere must have crossed it. The Yao Chief Machemba, the dread of Lindi and its vicinity, lives on the south side of the harbour and effectually closes any road that way.

The large river does not exist, however, as may be inferred from the number of streams crossed by Decken and Roscher which find their way into the sea about 5 miles south of Kisawera, not Kisawara Harbour, under the name of the Umbekuru. The late Commander Gray, of H.M.S. 'Nassau,' to whom we were greatly indebted for information regarding Lindi and its neighbourhood, told Bishop Steere that he had heard of a large river running into the sea, somewhere to the north of Lindi, and the Bishop despatched me with a companion to look for it. Owing to being sent a round-about way by the sea shore, and suffering from a severe attack of fever in consequence of a heavy march in a blazing sun, and our time being limited, we did not get farther north than Mchinga Bay, or Port Nungwa of the map, also surveyed by Commander Gray, and lately visited by Dr. Kirk in the R.M.S. 'Natal.' However, we heard sufficient from the natives to satisfy us as to its existence and great size in the rainy season, when it was reported to attain a breadth of about 1000 yards or thereabouts. We crossed two rivers on our way from Lindi, the Mbanga and Kera, the latter of which was reported about 30 miles long, besides a small but deep river flowing into Mchinga Bay, beyond which were the Nondo, the Ruvu, and the Umbekuru. My colleague, the late Rev. C. A. James, had, at the same time as we went to Mchinga, gone west to Lake Lutambo, where he remained for several weeks, and it was crossing an open waterless plain, in search of the same river, known further inland as the Kwem Kuru, that he was taken with last and, as it proved, fatal attack of fever.

Having been sent by the Bishop to Kilwa Kavinji to obtain porters by dhow, I asked particularly about the Umbekuru, and its mouth was pointed out to me, a little south of Kisawera Harbour. The mountains on the accompanying map to the west of Kilwa, were seen from the western brow of a hill at the back of the town, composed chiefly of ironstone and quartz, and about 400 feet high (by two aneroids). The distant mountains, apparently very lofty, were at least 50 miles off; and I should say, from their fantastic and jagged peaks, decidedly of igneous formation. They appeared to stretch right across the valley of the Rufigi, and may be the chain of mountains through which that river is reported to cut its way. Of the country to the west of Kilwa, I could get no information, and though I was there ten days, in the whole of that time only came across one man who could give any information as to the Rufigi. He described a journey he had once made up the north bank of the river for fourteen days, to Moroko, a land



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of grain; they crossed many rivers of various depths, and there were rapids in the Rufigi, near Moroko. The people on the south side were Makua; on the north, Rufigi. Maroko was now (1875) overrun by the Mavite.

This man had also been to Mererés, the chief of Usango, about which Dr. Livingstone made so many enquiries. He described Mererés as being in the fork between two rivers, the Rwha and the Timbwe or Zimbwe, which came from Ufipa through the country of Muarooli. He drew a rough plan of the rivers on the ground, as neither Susi and myself at first understood what he meant, because he said in coming from Unyanyembe to Mererés he crossed no large river, and yet Mererés was between two. A glance at Cameron's map will show that the man was evidently speaking the truth as he came along the watershed between the Rhwa and Tanganyika. On being asked where the rivers went to, he unhesitatingly said "Rufigi."

He described the country rich in cattle and ivory, men armed with shield and assegais, wearing profusion of beads, but no other clothes. The Mazitu or Mavite five days south of Mererés. The caravan on leaving Usango crossed the Rhwa and journeyed to the coast along the north bank of the Rufigi, crossing many rivers, and passing through the countries of Upugi, Ukutu, Moroko (not the same as before), Kedai, Eringo, Makamba, Kwanimba, Kwandega, Veranji to Uboamaji. The man's name was Swedi Adiali. In all my cross questioning here and elsewhere my interpreter was Susi, the late Dr. Livingstone's faithful servant, and no mean geographer himself.

Hoping that this information may be of service to the geographical world at large,

I am, &c.,

ALFRED BELLVILLE, F.R.G.S.

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A LANGUAGE-MAP OF AFRICA.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—My attention is called to a statement made in your last number by Mr. Robert Cust, that he is "collecting materials for a language-map of Africa." Will you allow me to inform Mr. Cust of the fact—of which he does not seem to be aware—that the materials for such a map, with the map itself, have been already collected, and published by me in the volume on Africa recently issued by Mr. Stanford, and noticed in your columns. The map is, of course, on a small scale, but may be enlarged at pleasure, and the materials are as exhaustive as is, perhaps, possible in the present state of our knowledge. Mr. Cust calls for "a language-map of Europe," and other regions. He will, therefore, be glad to know that these also are either ready or in course of preparation for the corresponding volumes of Mr. Stanford's *Compendium of Geography and Travel*. When that series is complete, it is my intention to resume the subject in a separate volume, which will contain a complete classification of all known languages, based on their morphological and other relations, together with enlarged linguistic and tribal maps, covering the whole field. The languages and tribes of America, for instance, will be dealt with to the number of 1700, or thereabouts; and I think I may promise Mr. Cust that there will be very few omissions of any consequence.

A. H. KEANE.

10, NORFOLK TERRACE, W.

[We are all aware of the language-map of Africa, and of the excellent chapter on the African languages from the pen of Mr. Keane. But the map is on far too small a scale to be of any practical use. It is to be hoped that Mr. Keane is adequately acquainted with the difficulties of treating the American languages in the way he proposes, especially as regards their relations to each other. Some of these questions have not yet been solved, even by students who have devoted many years to the subject.—ED. *G. M.*]

Proceedings of Geographical Societies.

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ROYAL GEOGRAPHICAL SOCIETY.

Special Meeting of 7th February, 1878.

Mr. STANLEY'S EXPLORATIONS IN AFRICA.

A SPECIAL MEETING of the Society was held on the above date, in St. James's Hall, under the presidency of Sir RUTHERFORD ALCOCK, when Mr. STANLEY gave an account of his recent explorations. The hall was densely crowded, among those present being H.R.H. the PRINCE of WALES, the Prince Imperial, the Maharajah Dhuleep Singh, the Duke of Sutherland, the German Ambassador, Midhat Pasha, Lord Houghton, Lord Kinnaird, Lord Cottesloe, Lord Arthur Russell, Sir Henry Rawlinson, Sir Samuel Baker, Sir Harry Verney, Sir T. Fowell Buxton, Sir Douglas Forsyth, General Probyn, Colonel Ellis, Sir G. Nares, Sir Allen Young, Captain Cameron, R.N., Dr. Moffat, and many others.

In introducing Mr. Stanley, the PRESIDENT remarked that the distinguished explorer was in truth no stranger, He was already well known, and the nation owed him a debt of gratitude as the deliverer of Livingstone. His first exploration was a feat which might suffice for a man's life; but in his second journey he had succeeded in tracing the Congo to its head source, which feat had placed him in the foremost rank of great explorers. Everywhere he had been received with welcome, and he (Sir Rutherford) felt sure that the Royal Geographical Society would not be backward in rendering due homage and praise to such an explorer.

Mr. STANLEY'S rising was the signal for tremendous cheering. When silence had been restored, he said that he should like to have spent a long time in preparing a paper which would have given a reasonably accurate idea of the sad Continent which he had crossed to the great meeting which, as the President told him, had assembled to do him honour. He was told, however, that it would perhaps be better to tell his story as he would do had he met some of those whom he addressed at a camp fire in Central Africa. Besides, he had not had time to put a word he had to say in writing, and sometimes when he thought of the thousands of letters he was expected to answer he really wished himself back in Central Africa. He had heard that an African Explorer, when asked by one of those Englishmen who indulged in milk-and-water-sort of talk how he had treated the natives of Central Africa, replied, "My dear Sir, I treated them like gentlemen;" and he only wished to know how that explorer managed to do so. He would tell his story briefly and rapidly, but it would be mere affectation if he were to say he did not know that there were some present who did not agree with him in his treatment of some of the natives. If, however, there were any whose sensibilities he had shocked, he would like them to stand up so that he might see what they were made of. He flattered himself he had a little of the gift of measuring people, having made human nature his study, and to that fact he attributed much of his success in his march across Africa. When he met people who were kindly disposed, he treated them kindly. If he met a missionary he would try to learn from him how he proceeded in his work, and put in practice what he learned. It had been said by a certain anti-Stanley journal that he had been civilizing negroes with explosive shells, that he was a belligerent kind of person, and had shut the Continent instead of opening it. That was all nonsense, and he asked them not to believe it. Zanzibar, as they all knew, was the starting point of the explorer. On arriving there he sent his emissaries through the streets of the town to hunt up followers, and it was soon known

that the "open-handed white man," as he was called, was again on the island. Fifty or sixty men soon came to him and asked what he proposed to do. He said he meant to cross the Continent, though he should have to cross mountains and lakes, to make his way through wastes and forests, and have to face strange and savage tribes and races and nations. They said it would take years to do, so that they could never hope to see their families or native land again; but when he reasoned with them, they asked him how much he would give them. He said he would give them three dollars a month, and from 150 to 200 eventually signed articles for that sum. After a time, however, they returned and demanded five dollars a month, saying that the last explorer had given that sum, and he was obliged to comply. The day of starting at length came, and they landed on the East Coast of Africa, which had been so thoroughly described by Livingstone, Grant, Speke, Cameron himself, and others, that he need not say more about it or of his route until he broke off from his former track and headed for Lake Victoria. Before reaching the lake, he made the acquaintance of a tall, swarthy prince, whose perfectly natural manner and friendly tone were such as to win their way to the heart. He had then, he said, for the first time seen a white man. From the district governed by that prince he made his way to the country of the Masaai, who, it was said, delighted in the drinking of blood, They were a warlike people, and from what he saw of them he could say that if any one wished to be murdered there was no people on the earth who would be more likely to gratify that desire than those of whom he spoke. The people of Soona were equally savage and more suspicious. He endeavoured to conciliate them by making them presents of old tin pots and exhausted sardine boxes, but finding that, notwithstanding this, one of his men was killed and another badly wounded, he thought it wise to move on, but could only do so successfully after three days skirmishing. Soon afterwards he reached the region over which M'tesa ruled—Nganda. In him he found a good and kind man, and before he left, M'tesa not only observed the Islam, but also the Christian Sabbath, and he also had the Ten Commandments, the Lord's Prayer, and the Golden Commandment of our Saviour, "Thou shalt love thy neighbour as thyself," cut upon wood that he might contemplate them daily. Here he found a great harvest for the sickle of civilization and Christianity. The missionary that was required must be a practical man. He should, of course, be a teacher of Christianity; but to be truly successful he must be able also to give instruction in the construction of dwellings, in the cure of diseases, in agriculture, and be something, too, of a sailor. Such was the man that was wanted for the work; a band of such men would be the salvation of Africa. But, again, he must be tied to no Church or sect, he must love God and his Son, and teach the moral laws, and be in charity with all men, belonging to no nation in particular, but to the entire white race, exhibiting practically the interest taken by them in the welfare of the black. It had been said that the African was unimprovable and irredeemable; but that he wholly and utterly denied. Having reached Lake Victoria, and going to the Albert, he became acquainted with another ruler named Ruminika, who was also a natural born gentleman. He found it, however, a more difficult thing to make a Christian of him than of M'tesa, but a very pleasant month he spent in the district of that Prince. They next came to Ujiji, which had been spoken of as the watering-place of explorers. He could not, however, enjoy it long, as he had to follow up the work his predecessors had left undone. After navigating Lake Tanganyika they came to Nyangwe. Mr. Stanley then proceeded to speak of the river Lualaba, which Livingstone had mistaken for the Nile, and of his successful voyage—one which was beset with all but insurmountable difficulties—down the Congo. To reach it they had to make their way day after day through dense forests. The stories as to the ferocity of the natives of the towns and villages on the banks of the river terrified his men, and more than once he feared he would find himself deserted, and that the work he had set himself to do would remain unaccomplished. At length, however, the voyage was commenced. To pass the first falls they had to work night and day for 26 days, during which they cut 13 miles of road through forests, along which they carried their canoes. They were subject to constant attacks from natives. On one occasion no fewer than 63 war canoes came against them—the leading canoe being driven by 80 paddles—and each was filled with armed savages. He told his men that if they desired to see home again they must resist to the last, as they could hope for no mercy; but he ordered them not to fire till they were assailed, as they must first see what the natives came for. The order was strictly obeyed. It was not till poisoned arrows were shot at them and spears flung that they fired, and then the rattle of 52 muskets was heard in a country in which never musket had been fired before. He had done all he could to avoid fighting and only acted in self-defence; for his strong desire was to be and to remain on good and friendly terms with the various tribes he met with. Day after day, however, they were attacked, and, had in consequence, to suffer great privations, until, at last, they reached the cataracts. Fortunately the natives there were friendly. For five months they battled with every obstacle, till they reached the last cataract, 45 miles from Boma, and connecting the Congo with the Lualaba. From Tuckey's farthest to Boma was simply a fight against famine. Three days' journey from Boma he sent four men with a letter directed to any English resident, stating that 115 souls were in a fearful condition from want of food. Happily, the only agent from an English house in Boma got the letter, and he and the other merchants of the town sent them large supplies of biscuits and bread, and fish and rum, and tobacco. It was the relief of Lucknow over again. Thus was the work completed which he had set before him. In due time they reached the Cape, where one of Her Majesty's ships was placed at his service. He conducted his men back to Zanzibar, and as they touched the strand of their island they kissed the sand, and uttered the words, with which he would conclude,—"La Allah il Allah!" ("Thanks be to God.")

The PRINCE OF WALES, in proposing a vote of thanks to Mr. Stanley said that after the most interesting, exhaustive, and entertaining account which the distinguished traveller and explorer who had just sat down has given us, it is impossible for me not to express in my own name my thanks for what we have heard to-night and, perhaps, I may be allowed, as the spokesman of this large assemblage, to tender to Mr. Stanley our cordial and sincere thanks for the interesting evening we have spent under the auspices of the Royal Geographical Society. There is nothing for me to add after the address we have heard, but I think it will be evident to all present the wonderful endurance Mr. Stanley has shown and the privations he has undergone for the sake of science and geography. We congratulate him on his safe return after all he has gone through, and we sincerely hope that, if it is his intention once more to take or make so difficult and arduous a journey as the one he has so successfully accomplished, I, for one and I am sure all present will join me in the hope that his journey will be as successful as that of which we have just heard him speak.

In seconding the vote, Sir SAMUEL BAKER remarked that much of the progress of African exploration was due to the discovery of a most useful drug—sulphate of quinine. Many mysteries remained to be solved in Africa. Its history remained unknown. Tribes had been discovered which must have been in existence when the Pentateuch was being written and the creation

of man described by Moses. There was not a chiselled stone to be found in the whole of Africa. It was singular that in every portion of that continent domestic fowls were found. Sheep and oxen were similarly found, though wild sheep and oxen were not. Therefore the question arose, Whence came the progenitors of these animals, if the people had no intercourse with any other portion of the globe? Tobacco, which was formerly believed to be confined to the continent of America, was found cultivated in most parts of Africa, but never indigenous. So with Indian corn, which was supposed to come only from America, it was found growing in most portions of Africa, but never indigenous. Neither was the castor oil plant, which was always found growing near habitations, indigenous. If Africa was to have a future she must have means of communication, and must have some natural productions which would lead to commerce, and lead the natives to industrial pursuits. As for Mr. Stanley, no one who had not travelled in Africa could appreciate his labours, and he was sure he would look back to the encouragement he had received that evening from the PRINCE OF WALES, which also expressed the voice and opinion of England.

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FRENCH GEOGRAPHICAL SOCIETY.

January 9th, 1878.—M. LEVASSEUR presiding. The Minister of Public Instruction announced that he had sanctioned a grant to the Society of 1000 francs, as payment for fifty copies of the *Bulletin* for 1878. The Princess Doria d'Istria sent a copy of a work called *Greece before the Greeks and the Albanians in Rumania*. M. F. DELONCLE advised the despatch of a tracing of a map of Africa, taken from a terrestrial globe containing valuable information regarding the travels and discoveries of the Jesuits and Portuguese Capuchins in the sixteenth and seventeenth centuries. M. DAUBREE, Director of the School of Mines, made announcement of an International Congress of Geologists, which will assemble at Paris on the 19th August.

M. D. CHARNAY gave an account of his ascent of Mount Popocatepetl, in Mexico. He made reference to previous ascents of the same mountain—the most notable of which was the ascent by five Spaniards in 1522, who were the first Europeans to reach the summit. M. Charnay's description of his own ascent was very interesting, and the view from the summit appears to have been most magnificent.

M. LEON ROUSSET, Director of the Arsenal of Chow-fu, read a paper on the basin of the Yellow River.

January 23rd, 1878.—M. DAUBREE presiding. M. DE FONVIELLE made a communication to the Society on the subject of Captain Howgate's schemes for Polar exploration. M. RAFFRAY read an account of his recent travels in the north of New Guinea. He made Dore in Geelvink Bay his head-quarters, and journeyed along the coast for a distance of about 100 kilometres, in the course of which he rectified the position of the mouth of the Prafi, and discovered several other streams. Besides making some trips inland he visited the Sowek and Korido islands and made careful ethnological researches. He divides the population of the north-west of New Guinea into four families, viz., the Mafors, who are found in the Mafor and Mansinam islands, and at Dore and Amberbaki; the Arfaks, who live in the mountains around the bay at Dore; and the inhabitants of the Biak islands, who are likewise to be found at Korido and doubtless also at Jobi. These three families are closely connected. There are also the Karus, a cannibal race inhabiting the mountains overlooking the northern coast, and who differ greatly from the other Papuan races in the rounded shape of their head and other characteristics. M. Raffray compiled vocabularies of the Mafor and Amberbaki dialects, and brought home extensive collections of native implements, besides photographs of ethnological types.

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PARIS SOCIETY OF COMMERCIAL GEOGRAPHY.

January 10th, 1878.—M. POMEL presiding. M. BEAUVISAGE read an interesting paper on the industrial wealth of Belgium, and recommended the establishment of an industrial museum at Antwerp, which is the chief outlet for the trade of the country.

January 21st, 1878.—Count FOUCHER DE CAREIL presiding. A letter was read from M. Ch. Hertz, the Secretary to the Society, who had reached the Ashanti country. The President gave an amusing and spirited account of Mr. Stanley's reception by the French Geographical Society, and expressed his opinion that Mr. Stanley, far from being a cold and reticent person, was astonished and dazzled by the civilisation from which he had been shut out for three long years. After giving credit to the proprietors of the *New York Herald* and *Daily Telegraph* for their liberality in organising the expedition, Count Foucher de Careil mentioned that at his departure Stanley weighed 11 stone 6 lbs., and on his return he weighed only 8 stone, but that he was picking up rapidly.

M. BEAUVISAGE referred to the charges of cruelty brought against Mr. Stanley, and mentioned, as a proof to the contrary, that he had sold three thousand pounds' worth of ivory for the benefit of his followers, and reconducted them safely to their country.

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LYONS GEOGRAPHICAL SOCIETY.

Monthly Meeting of December 27th, 1877.—Lieut.-Colonel DEBIZE presiding. The Minister of War sent several maps of Algeria, with reference to Colonel Champanhet's researches on the creation of an inland sea and the laying down of a railway in the Sahara desert. The Canon CHRISTOPHE read the conclusion of his paper on the geography of Gaul according to Marcellinus; the former part having dealt with the administrative, historical, and topographical geography, and this part being devoted to a consideration of its physical character. Colonel CHAMPANHET read a paper on the future civilisation of Africa, in connection with the Brussels Conference.

January 20th, 1878.—Professor CH. PERRIN inaugurated a course of historical and military geography by a lecture on the movements of the armies and fleets of the Ottoman Empire up to the sixteenth century.

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IMPERIAL RUSSIAN GEOGRAPHICAL SOCIETY.

Annual Meeting of January 11th, 1878.

M. P. DE SEMENOF, Vice-President, presiding. The publications of the Society during 1877 were laid on the table. These included the Results of the Ethnographical and Statistical Expedition in the Western Provinces, one volume of the work of the Amu-Daria Expedition, the account of the levelling between the Aral and Caspian Seas, the fourth volume of the translation of *Ritter's Asia*, with appendices to the third volume, by Messrs. P. Semenof and G. Potanin; the seventh volume of the Memoirs of the Ethnographical Section, and the account of Colonel Prejevalsky's last expedition, entitled, *From Kuldja to the Tian-Shan and Lob-Nor*.

The SECRETARY gave obituary notices of the various

members of the Society who had died during the year under review, including the names of Messrs. N. Barbot de Marny, P. de Helmersen, and others. M. SREZNEVSKY then read the chapter treating of the Expeditions of the Society, including those of Messrs. Prejevalsky and Potanin in the North-West of Mongolia, Maïnof in the Basin of the Volga, &c.; and the Vice-President read a telegram regarding Colonel Prejevalsky's recent illness, and a dispatch announcing Mikluko-Maklai's return from New Guinea to Singapore.

The award of the medals was as follows:—The Constantine Medal (awarded this year by the Ethnographical Section), to M. Zakharof, for his Dictionary of the Manchu tongue; Count T. de Lütke's Medal to M. Rykatchef, for his works on the climate of Russia in general, and particularly on atmospheric pressure in Russia in Europe. In the section of Physical and Mathematical Geography, a small Gold Medal was awarded to M. A. de Thilo, for his levels between the Aral and Caspian Seas; and to M. Marx, for Ten Years of Meteorological Observations. In the Ethnographical Section, a small Gold Medal was awarded M. Matreief, for his researches in regard to national customs and rights.

The Silver Medals were awarded as follows:—To M. Kuropatkin, for route surveys and barometric heights from Osh to Korle by way of Kashgar and Karashar. To M. Sidensner for his astronomical observations on the water-parting between the Ob and Yenisei rivers. To M. Mushketof, for his researches on the orography of the Tienshan. To Messrs. Struve and Moshkof, for their series of levels between the Aral and Caspian seas. To Messrs. Bolshef and Kramorof, for levels from Kimilter to Lake Baikal. To M. Schwanenberg, for the account of his journey in the schooner 'Zaria,' from the mouth of the Yenisei to St. Petersburg. To M. Noumellin, for eleven months meteorological observations taken at the mouth of the Yenisei. To M. C. Mulberg, for his assistance in the registration of meteorological observations at stations on the Amu-Daria. In the Ethnographic Section, to M. Efimenko, for his work on the customs of the inhabitants of the Arkangel district; and to M. Uspensky, for his work on the Kuku Nor country and the Mongols; and in the Statistical Section, to M. Stein, for certain researches in regard to funded property in St. Petersburg. A Silver Medal was also granted, by order of the Council of the Society, to Madame Clara Fuss for her botanical illustrations to the third volume of Colonel Prejevalsky's work on Mongolia and the Tangut country.

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SPANISH GEOGRAPHICAL SOCIETY.

IN February 1877, a Spanish Association for the exploration of Africa was formed at Madrid, of which the King became President. The Association was to hold meetings, publish information, collect subscriptions, and promote African exploration. At the first meeting the King offered to defray the main part of the expenses of an expedition, the object of which would be to explore some parts of the west coast of Africa opposite to the Canary Islands.

In the numbers of the *Boletin* for August and September 1877, there are papers on the travels in Morocco of Don José Maria de Murga, under the name of Hajji Muhammad el Baghdadi; and in the September number there is an elaborate paper, with a map, on the kingdom of Tonquin, communicated by M. Soulère, the Spanish Consul at Saigon. The October number contains a paper by Don Juan Facundo Riaño on the travels of foreigners in Spain during the fifteenth century. Señor Riaño enumerates six travellers during that period, whose narratives have been preserved. The first was Messire Guillebert de Lannoy, an Ambassador from Flanders in 1405, who served in a campaign against the Moors of Granada, and went on a pilgrimage to Santiago. The second was another Fleming named Jaques de Lalain, aged twenty-two, who came with the sole object of fighting on horseback and on foot with anyone who would accept his challenge. He died in 1453. Jorge Ehingen, a Hungarian or Swabian, who was in Spain from 1454 to 1457, and also at the siege of Ceuta, was the third. The fourth was an anonymous German, the text of whose interesting narrative was discovered by Don Pascual de Gayongos, in the British Museum The most important, however, was the Bohemian Rosmital, who came to Spain in 1465, and wrote a very full account of all he saw. The sixth traveller was a herald named Machado, employed by Henry VII. of England, and probably of Portuguese nationality. He gives a curious and very detailed account of the dress of Queen Isabella. There can be no doubt of the importance of such accounts of travellers to illustrate historical and geographical knowledge of any country.

In another paper, in this October number, Don Enrique Dupuy de Lôme discusses the eastern question, and shows that the descendants of the conquerors of Lepanto take the same view in favour of freedom for oppressed nationalities as is held by the best and most patriotic among the countrymen of the heroes of Navarino.

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HAMBURG GEOGRAPHICAL SOCIETY.

December 6th, 1877.—Dr. NEUMAYER presiding. The President referred in warm terms to the loss of the African traveller Von Bary. Herr LINDEMANN, from Bremen, read a paper "On the Possibility of Sea Communication with Northern Siberia." The President spoke on the project of Count Wilczek and Lieutenant Weyprecht for an international series of Arctic observing-stations.

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January 3rd, 1878.—Dr. KIRCHENPAUER presiding. Dr. HILDEBRANDT, of Berlin, gave an account of his journeys in Eastern Africa since 1872, and a special notice of his journey in 1877, from Mombasa to Mount Kenia.

Herr FRIEDERICHSEN read a paper on Dr. Pfund's journeys in 1875 and 1876 in Kordofan and Darfur, based on his letters written in El-Fashir. These furnish information regarding Colston Prouth, and Purdy's expeditions, in the two former of which he (Dr. Pfund) held the position of physician and naturalist.

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Letters and Articles intended for insertion should be written on one side of the paper only, and must be accompanied by the name and address of the writer; not for publication, but as a mark of good faith.

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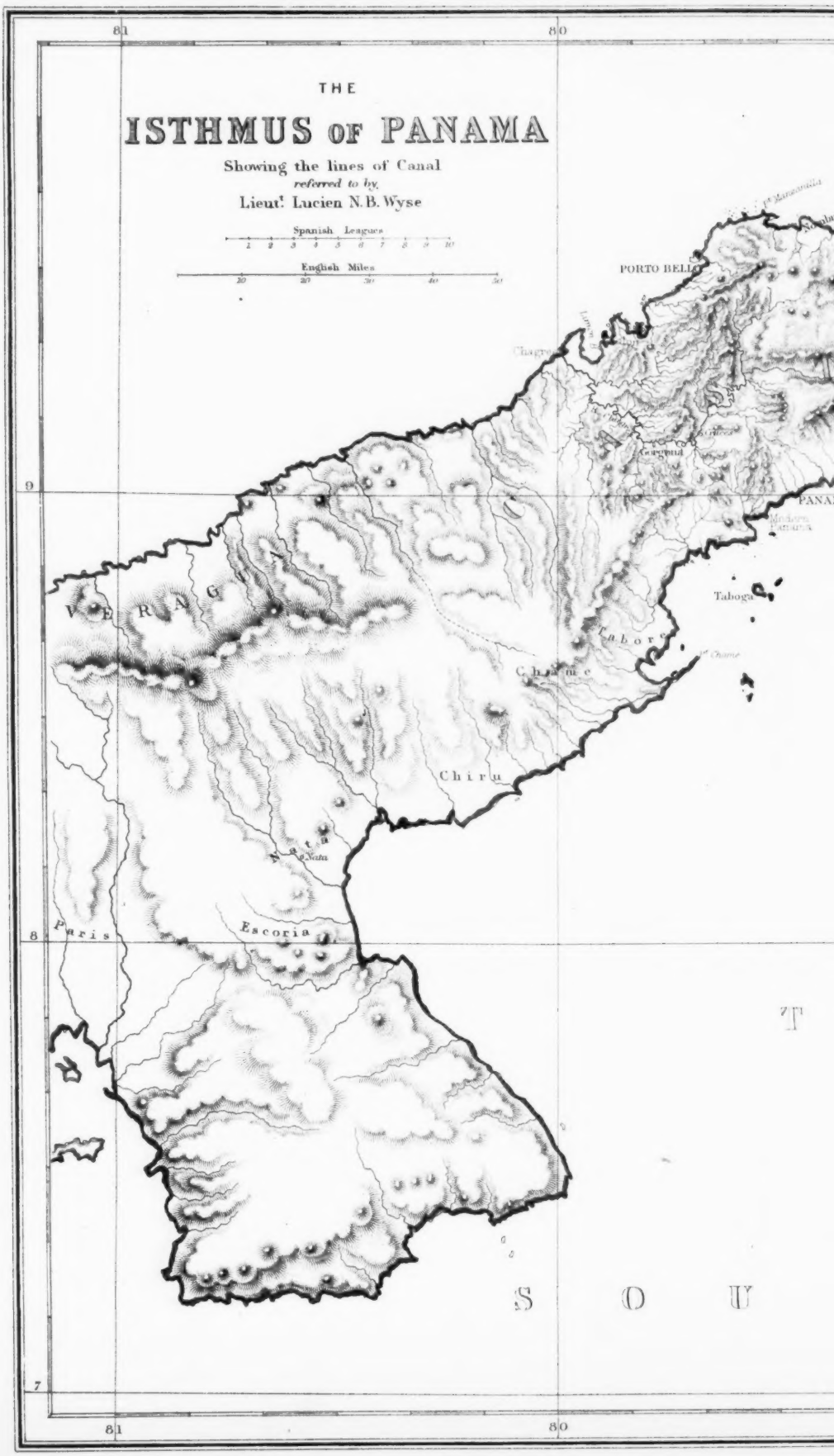
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